ENGINEERING NEWS-RECORD

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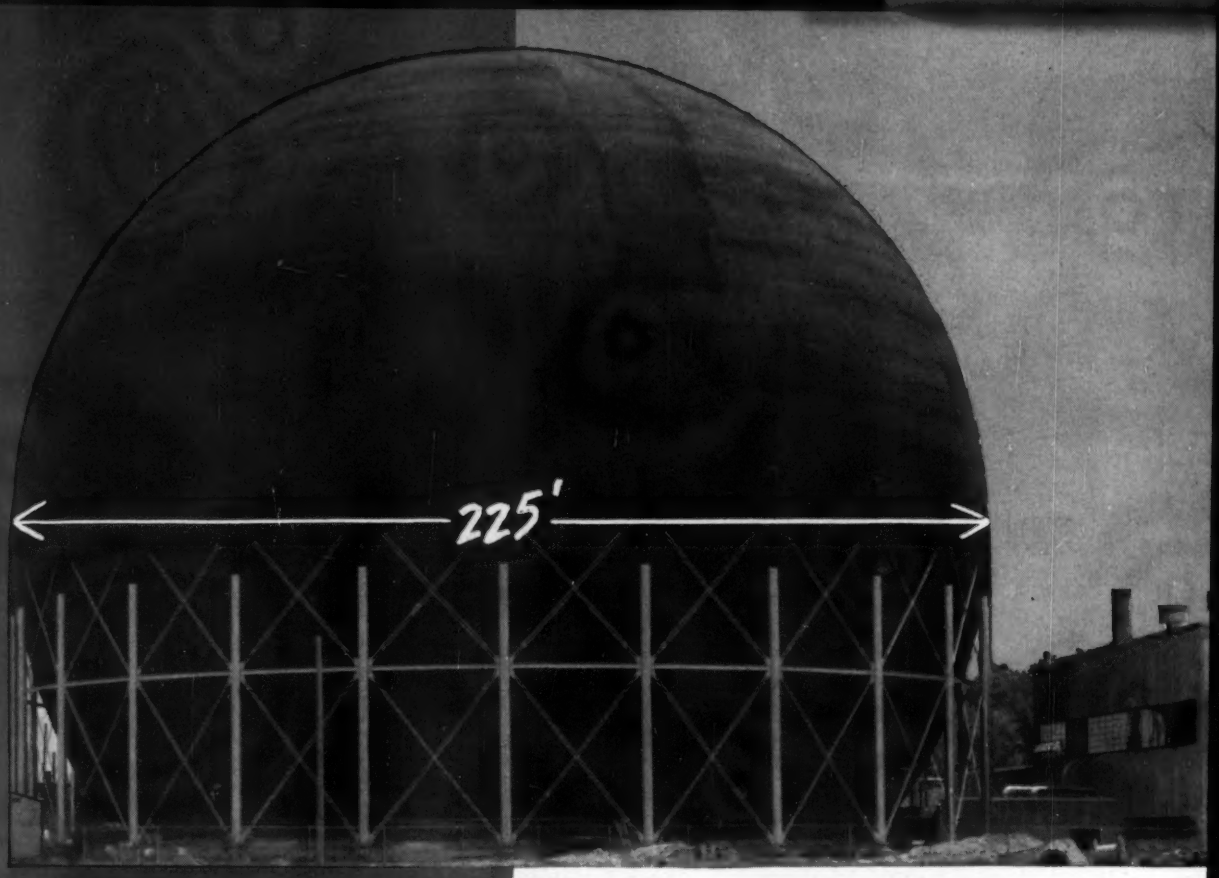

WORLD'S LARGEST SPHERE

(a Hortonsphere®)

Proving Ground for Hull of Submarine Prototype

The world's largest sphere, a Hortonsphere® 225 feet in diameter, was built by CB&I at West Milton, N. Y., for testing the prototype of an atomic power plant for submarines. The vessel, which is to use the nuclear type power plant tested in the Hortonsphere, is the SSN575 Seawolf. Designed as a pressure vessel, the sphere is a protective structure that will contain all radio active materials in the most unlikely event that all safety devices should fail simultaneously. The sphere has an atmospheric volume of 6,000,000 cu. ft., reaches 18 stories high, is insulated and air-conditioned.

The special Hortonsphere was fabricated and erected by CB&I experts at West Milton, N. Y., the test site of Knolls Atomic Power Laboratory which is operated for the U. S. Atomic Energy Commission by General Electric Company. This unusual welded plate structure is another of many engineering accomplishments by Chicago Bridge & Iron Company. When *you* plan welded steel plate structures, write our nearest office for help and information.

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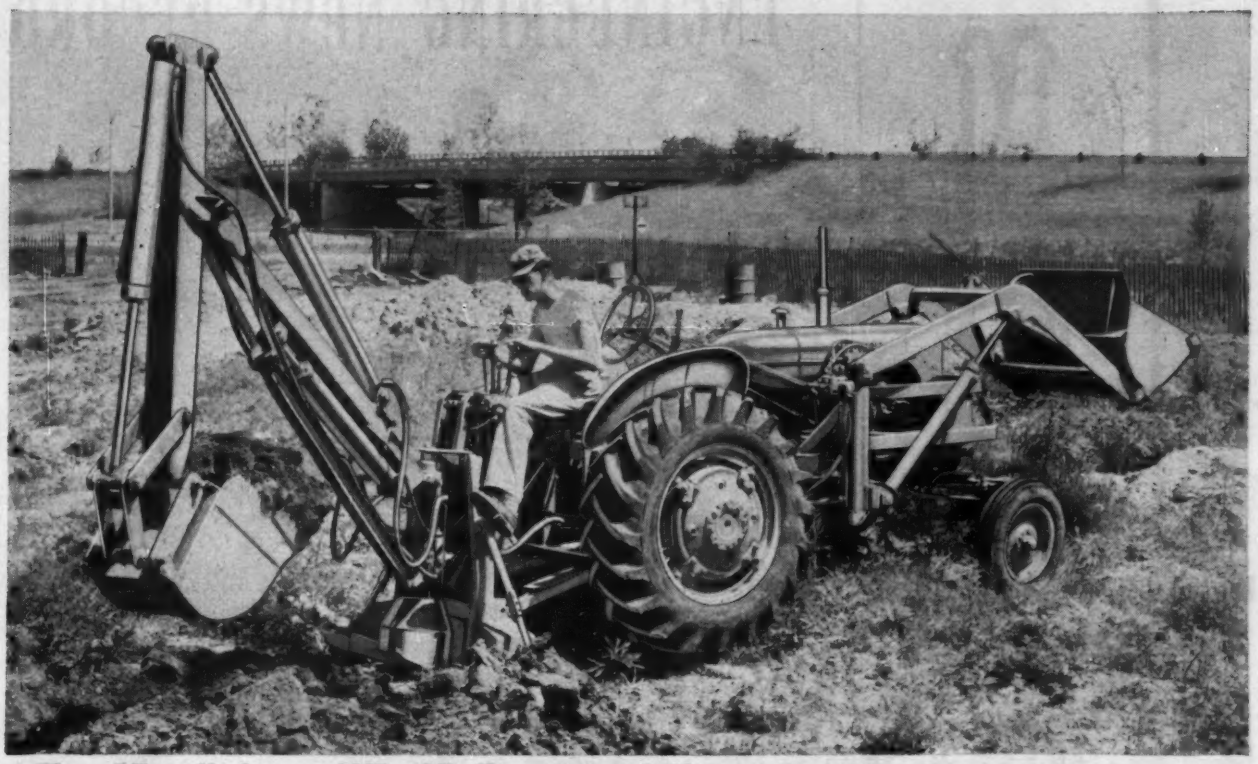

The Allis-Chalmers WD-45 Tractor and Henry Backhoe

Handyman around any construction job

- 45 belt hp — gasoline engine
- Weight, 6,100 lb
- 10-ft 6-in. digging depth, 13-ft 10-in. reach with telescoping boom
- 8-ft digging depth, 12-ft 4-in. reach with standard boom
- Loading height, 8 ft
- Swing arc, 160 degrees

Mobility and Versatility keep the WD-45 with backhoe busy on a wide range of jobs — digging ditches, trenches, culverts, footings, foundations, and on backfilling. This unit is mobile enough to reach even the hard-to-get-at places — has the power and strength to help out on big operations — is small enough to work economically on the low-yardage jobs — get maintenance and clean-up work done fast.

Greater Working Range is now available with the Henry telescoping boom — digging depth of 10 ft 6 in. and reach of 13 ft 10 in. To widen the job range, there are seven interchangeable buckets, 12- to 24-in. width, front-end loader, and backfill blade attachments.

More Work Capacity because heavy-duty backhoe assembly is all-steel, box channel construction to take rough, hard use. All-hydraulic cylinders are powerful double-acting type with large-diameter piston rods. Replaceable bushings are on all wear points for longer life and less maintenance.

Long-Life Power. With big power output at low piston speed, the POWER-CRATER engine gives dependable, high-output performance on the tough jobs. Full-pressure lubrication, exhaust-valve rotators, removable exhaust valve seat inserts, and removable "wet" type cylinder liners contribute to long-life performance.

Operating Advantages help do a more efficient job in less time. Two-clutch control lets the operator make short moves while digging, with easy-to-reach hand control. Power-Shift rear wheels permit quick, easy shifting to wider wheel tread in soft footing or whenever more than normal tread is required for increased stability.

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

POWER-CRATER is an Allis-Chalmers trademark

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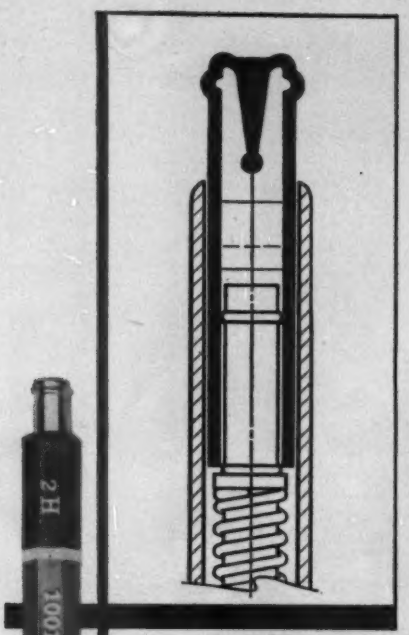

something new on

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Now it's the new, sturdy, solid brass lead sharpener built into the Technico Mars-Lumograph push-button lead holder. Saves you work, time, money.

Get the imported Mars Technico lead holder and leads today—they are the best, yet cost no more.

The 1001 Mars Technico clutch mechanism holds leads securely; light in weight, perfectly balanced; $1.50 each, less in quantity.

1904 Mars-Lumograph leads are so opaque, inking-in is unnecessary; won't flake or smudge, give better reproduction. Perfectly graded in 18 degrees—EXB to 9H; $1.20 doz., less in quantity.

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Number of Copies of this issue printed 68,268

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Publisher

August 18, 1955 ENGINEERING NEWS-RECORD Vol. 155, No. 7

Member ABC and ABP

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BG

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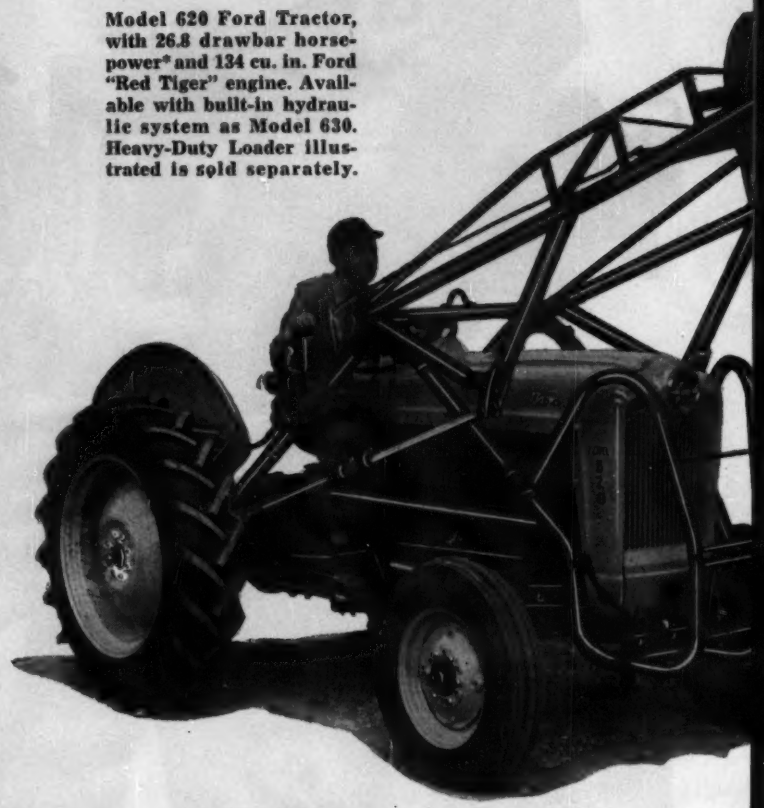
NEW! FORD SPECIAL UTILITY TRACTORS

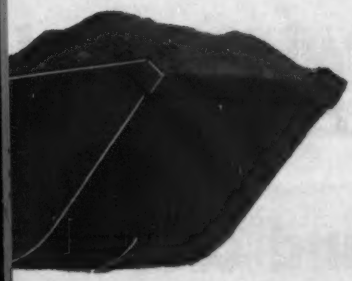
Ford TRACTORS



Model 620 Ford Tractor, with 26.8 drawbar horsepower* and 134 cu. in. Ford "Red Tiger" engine. Available with built-in hydraulic system as Model 630. Heavy-Duty Loader illustrated is sold separately.

Model 820 Ford Tractor, with 35.0 drawbar horsepower* and 172 cu. in. Ford "Red Tiger" engine. Backhoe illustrated is used with transmission PTO, both sold separately.

*Manufacturer's Rating



Lowest-priced power for dozens of jobs!

Now your dollars work harder in a Ford Tractor! They buy more work horsepower—no extras unless you want them!

Yes, in Ford's new Special Utility Tractors you get the power you need for fast, efficient loading . . . low-cost hauling . . . easy 'dozing. You get features like famed Ford Tractor maneuverability . . . passenger-car ease of handling . . . exceptional operating economy.

And, new Ford Special Utility Tractors are lower priced—give you more horsepower per dollar. If you don't need power take-off, you can now buy a Ford Tractor without it.

Your nearby Ford Tractor and Equipment Dealer can tell you more about Ford's new Special Utility models . . . about how they can save you money in a loading or digging "package". He can also tell you how eight other new Ford Tractor models can be equipped to fit an extremely wide range of jobs. Just look him up in the Yellow Pages . . . then give him a call and get all the facts!

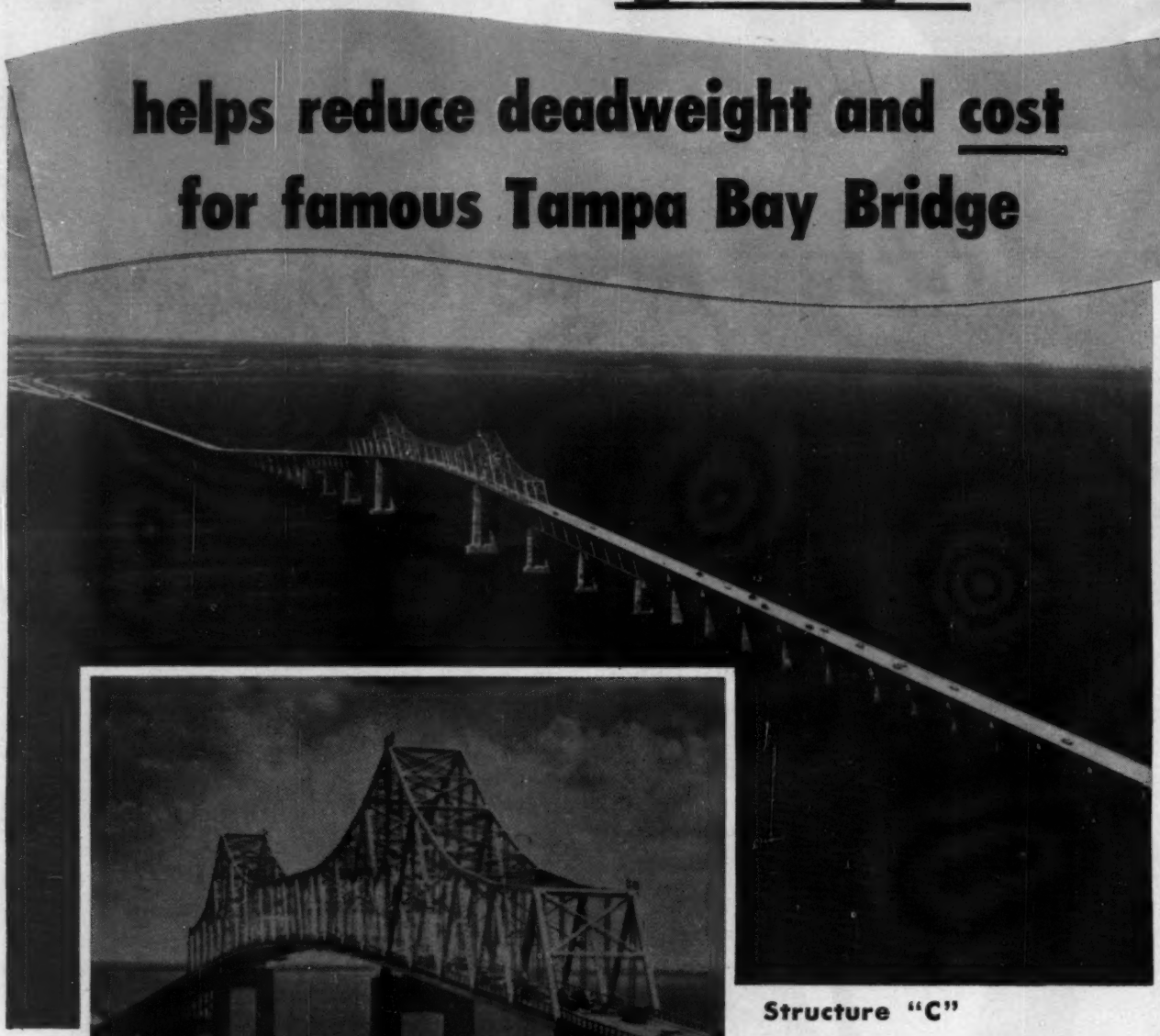
TRACTOR AND IMPLEMENT DIVISION

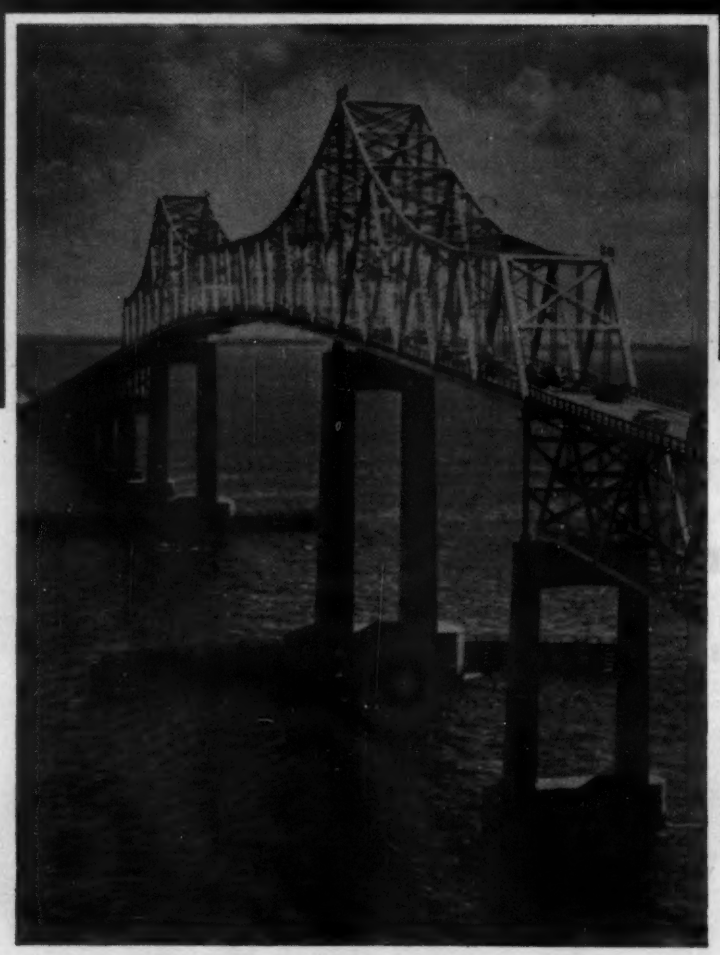
FORD MOTOR COMPANY

BIRMINGHAM, MICHIGAN

OPEN TYPE lightweight steel

helps reduce deadweight and cost for famous Tampa Bay Bridge





Structure "C"

Sunshine Skyway

over Mullet Key Channel,
Lower Tampa Bay
near St. Petersburg, Florida

Owner:
State Road Dept. of Florida

Design and
Supervision of Construction by:
Parsons, Brinckerhoff, Hall & Macdonald.

Superstructure for:
5,621' bridge fabricated and erected by
AMERICAN BRIDGE

USS I-BEAM-LOK steel flooring for:
864' Main Span fabricated by
UNITED STATES STEEL

flooring on high main span

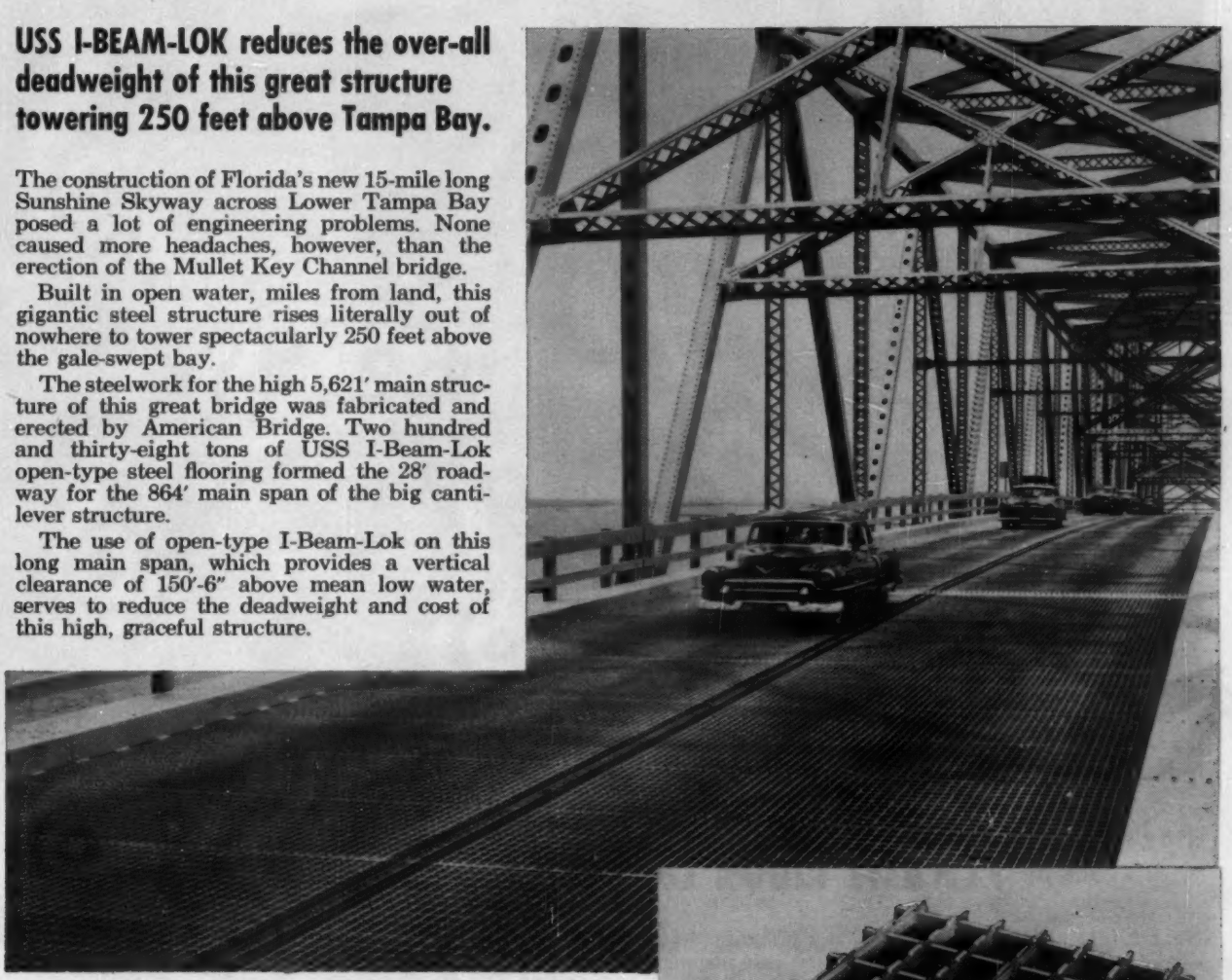
USS I-BEAM-LOK reduces the over-all deadweight of this great structure towering 250 feet above Tampa Bay.

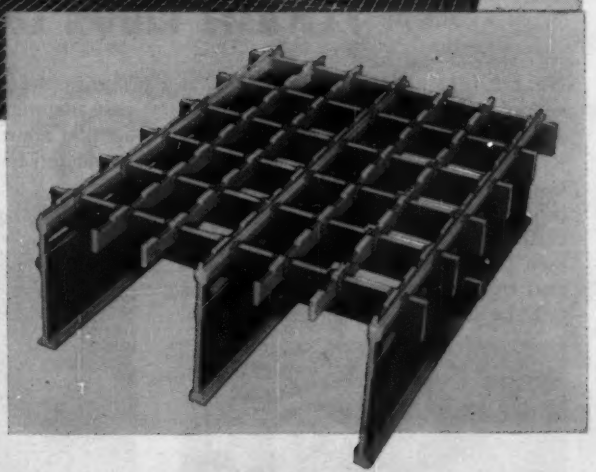
The construction of Florida's new 15-mile long Sunshine Skyway across Lower Tampa Bay posed a lot of engineering problems. None caused more headaches, however, than the erection of the Mullet Key Channel bridge.

Built in open water, miles from land, this gigantic steel structure rises literally out of nowhere to tower spectacularly 250 feet above the gale-swept bay.

The steelwork for the high 5,621′ main structure of this great bridge was fabricated and erected by American Bridge. Two hundred and thirty-eight tons of USS I-Beam-Lok open-type steel flooring formed the 28′ roadway for the 864′ main span of the big cantilever structure.

The use of open-type I-Beam-Lok on this long main span, which provides a vertical clearance of 150′-6″ above mean low water, serves to reduce the deadweight and cost of this high, graceful structure.





USS I-BEAM-LOK... the heavy-duty steel flooring for modern traffic

USS I-Beam-Lok open-type steel flooring is available in units measuring 6′2″ in width and up to 49′ in length. This lightweight, all-steel flooring with its strong, full 5″ depth can be applied directly to stringers on spans up to 4′ centers to permit H-20 loadings. It does not require secondary supports. It combines weight saving and reduced costs with roadway rigidity, ease of erection, and low maintenance costs. For more information about the time-and-money saving advantages of this superior lightweight steel flooring in bridge construction, contact the sales office nearest you.

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS I-BEAM-LOK

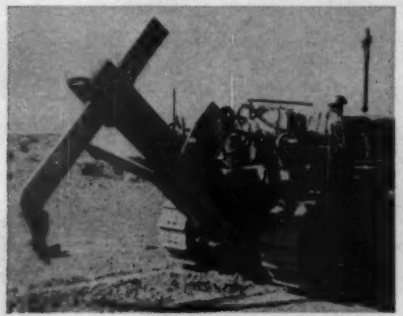
USS

UNITED STATES STEEL

This photo group shows: right, a newly fabricated ripper tooth boot (back side) welded from mild steel plate; center, hard-faced with stringer beads of Coated Tube Stoodite, and left, front side of worn boot after 3 days' service.

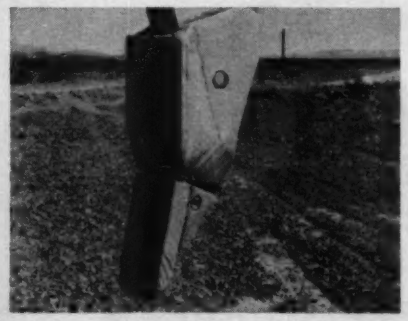
HARD-FACED RIPPER TOOTH
Lasts 1200% Longer on Desert Duty!

Near Ludlow, California, PG&E is spanning the vast Mojave Desert with a gas pipeline. To ease the trenching job a gigantic ripper is towed by a D7 tractor ahead of the ditcher. Its purpose is to break up the hard-packed earth and locate the frequent sub-surface lava flows. This lava is so hard and tightly bonded that explosives must be used to break up the formation.



Depth at which ripper operates is evident by length of standard.

The ripper on this job is designed for easy maintenance; boot type point and adapter are replaceable. The points are fabricated from mild steel plate in the



Close-up shows point attached to tooth adapter. Entire tooth is hard-faced with Coated Tube Stoodite.

division headquarters maintenance shop of the pipeline company handling the job, Engineers Limited Pipeline Co., Bakersfield, California. All four sides are hard-faced with Coated Tube Stoodite before being placed in service.

Working deep in the highly abrasive earth, unprotected boots last only 2 hours. When hard-faced with Coated Tube Stoodite this short life is extended to three full days—an increase of 1200%.

Coated Tube Stoodite is a recent Stoody development for manual application, combining high wear resistance, good impact strength, fast deposition and low cost. Ask your Stoody dealer for details (consult the yellow pages of your phone book) or write direct.

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. . . then turn on the rain!

Agriculture, Industry and Municipalities—north, east, south and west—are rapidly taking the worry out of weather! Farmers and ranchers, as well as civic engineers and plant operators, are discovering in ever increasing numbers that a controlled, reliable source of water is sound economy.

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TWIN-POWER "EUCS" ON

Power to move the earth! A Euclid TS-18 Scraper with two engines and total of 494 h.p. is push loaded by a TC-12 "Euc" tractor powered by two 194 h.p. engines—a total of 882 h.p. at work. Because of the difficult sandy conditions, Western's scrapers are equipped with extra power for the tractor drive axle—300 h.p. rather than 194 h.p.

Euclid Twin-Power Provides Unequalled

WORKABILITY

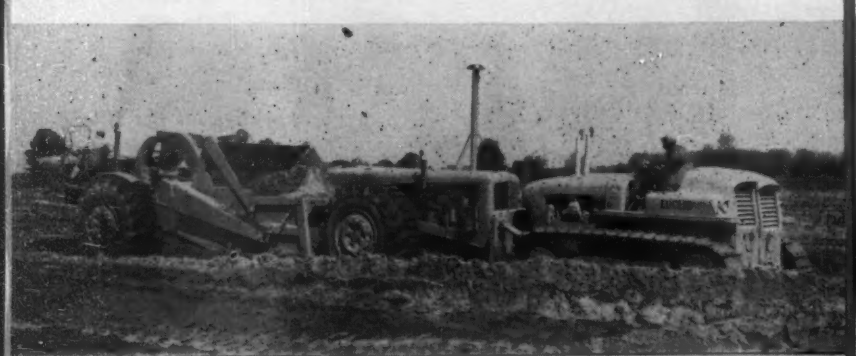
Twin-Power—the use of two engines driving separate axles—was pioneered in the earth moving field by Euclid nearly 10 years ago. It provides larger capacity with power equal to or greater than single engine equipment . . . uses power and drive components that have proved their performance in other equipment on hundreds of jobs. Torque converters and semi-automatic transmissions assure easy operation and a smooth flow of power to meet all job conditions.

This TS-18 is one of Euclid's newest scraper models. It has a struck capacity of 18 cu. yds. . . . standard power is two 194 h.p. diesels with Torqmatic Drives. Western Contracting is using 10 of these "Euc" scrapers on the Indiana Turnpike.

*

See Euclids complete line at General Motors POWERAMA - The World's Fair of Power - Soldier Field Chicago, Illinois, August 31 through September 25.

There's twin power in these 50-ton Rear-Dumps too! Six of these big units, first used by Western on Ft. Randall Dam, are working under an 8 yd. dragline. With a total of 600 h.p. this "Euc" has plenty of power and traction to move capacity loads through loose sand and tough hauls.



"Performance far above expectations" is the way personnel on Western's job describe the overhung engine Twin-Power Scraper push loaded by the new Euclid Twin Crawler.

WESTERN CONTRACTING'S

7 million yard Indiana Turnpike job!

Western Contracting Corporation is grading 27 miles of the new Indiana Turnpike east of Elkhart. About 7 million yards must be moved by November, 1956—work is currently on a two 10-hour shift basis six days a week. It's a big job—one that demands dependable equipment that can move big loads fast . . the kind of job where Euclid Twin-Power performance really pays off.

On one section of their contract Western is using five TS-18 Euclid overhung Twin-Power Scrapers and 2 "Euc" TC-12 Twin Crawler tractors. Working in sand, the "Euc Twins" pick up loads of 15 bank yards or more and make round trips of a mile every 5 minutes, each averaging 180 bank yards production per hour. They travel at speeds up to 30 m.p.h. with full payloads and make the return trip over good haul roads with a top speed of 35 m.p.h.

Five other Euclid Twin-Power Scrapers and two additional TC-12 tractors are making the dirt fly on another section of Western's contract. On still another part of the job six 50-ton "Eucs" are hauling from an 8 yd. dragline. These Rear-Dumps, veterans of Ft. Randall Dam, are powered by two diesels having a total of 600 h.p. For complete information on the complete line of Euclid earth moving equipment or models suited for your jobs, call your Euclid dealer soon.

As of June, 1955, these successful bidders on the Indiana Turnpike are depending on "Eucs" to keep their jobs on schedule:

Arcole-Midwest Corp.
Chapin & Chapin
A. L. Dougherty
Peter Kiewit & Sons' Co.
D. R. Smalley & Sons
Suber & Co. and Ballenger Paving Co.
Union Building & Construction Corp.
Western Contracting Corp.
Winston Bros.

● ● ●

Again "Eucs" outnumber all competitive rubber-tired equipment combined on a big turnpike project!

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

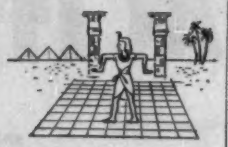
Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

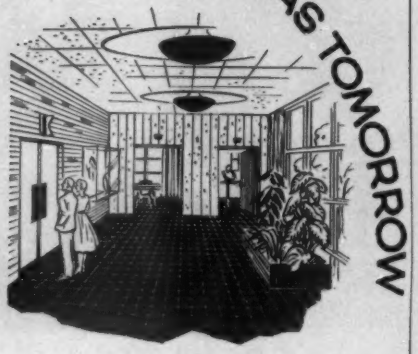
EUCLID

GM GENERAL MOTORS

AS OLD AS THE PHARAOHS



AS MODERN AS TOMORROW



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Summitville TILES, INC.

SUMMITVILLE, OHIO

READER COMMENT

A Question of Ethics

SIR: Prior to my recent term of office as city attorney of Grand Rapids, Mich., I had very little acquaintance with consulting and practicing engineers, or for that matter with any engineers. During the period of my incumbency, however, I learned much concerning the activities of such professional men.

I have noted the competitive rivalry, accompanied by the overtones and innuendoes of name-calling and unfair criticism which seems to exist among professional engineers.

It has occurred to me that when a good and recognized firm of professional engineers has been retained to design and supervise a particular project, other engineers should refrain from unsound criticism of the project, and most certainly should abstain from efforts to supplant the aforesaid designing and supervising engineer.

As a result of that experience, I have had occasion to study an engineering code of ethics. If I read that code correctly, it is not improper for one engineer to succeed another if the services of the other have been terminated. But that would assume that the termination has been legal, ethically proper and for good cause. Certainly no self-respecting engineer should play any part in the termination of the services of another man, particularly if the services of the latter were obtained on the basis of a valid continuing form of contract for professional services, or if the services of the latter have not been paid for in full.

It is my feeling that until such contract has been terminated in correct legal manner and in full compliance with ethics accompanied with proper payment in full, there should be no competition to supplant the holder of the contract on the part of professional engineers.

The code of ethics of the American Society of Civil Engineers, Section 6, provides that it is unprofessional "to review the work of another engineer for the same client except with the knowledge or consent of such engineer, or unless the connection of such engineer with the work has been terminated". I have already adverted to the word "terminated". But it seems to me that this provision still is lamentably weak, and made so by the use of the disjunctive "or". All that one engineer has to do is to make it known to the retained engineer that the former will review the work. Under the phraseology of this section, "consent" is not necessary, and its inclusion here is seemingly meaningless.

I should very much like to hear from your readers as to their interpretation of the clause above referred to, and what custom and usage is under it.

SAMUEL H. HIMELSTEIN
Attorney at law,
Grand Rapids, Mich.

A Lot of Water

SIR: In your issue of July 14, p. 24, in the caption under two pictures, "Two Miles of St. Lawrence Dewatered", the 65,000,000 gal quoted was an error, the correct figure being 650,000,000 gal.

With pumps working at 80,000 gpm, 65,000,000 gallons would be pumped out in a little over twelve hours. The correct figures, as given by the Ontario Hydro-Electric Power Commission, were 2,4000 acre-ft of water to be pumped out, or approximately 653,400,000 gal.

J. D. MILLAR
Deputy Minister (Engineering)
Ontario Department of Public Works

CALENDAR

Pennsylvania Sewage and Industrial Wastes Association, annual conference, Pennsylvania State College, Aug. 22-24.

American Society of Civil Engineers, hydraulics division, University of California, Berkeley, Calif., Aug. 24-26.

International Association for Hydraulic Research, 6th Plenary meeting, Delft, Netherlands, Aug. 29-Sept. 2.

New York Section, American Water Works Association, annual fall meeting, Saranac Inn, Saranac Inn, N. Y., Sept. 8-9.

Western Association of State Highway Officials, annual conference, Jackson Lake Lodge, Wyo., Sept. 8-10.

New England Water Works Association, Lake Placid Club, Lake Placid, N. Y., Sept. 18-22.

International Road Congress, Dolmabahce and Yildiz Palaces, Istanbul, Turkey, Sept. 26-Oct. 16.

American Public Works Association, congress and equipment show, Milwaukee, Wis., Oct. 2-5.

Federation of Sewage and Industrial Wastes Associations, Ambassador Hotel, Atlantic City, N. J., Oct. 10-13.

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NO JOINT-LEAKS

NO DANGER OF FAILURE

PROJECT: Waste Disposal Line for Esso Standard Oil Company Baltimore Refinery, Baltimore, Md.

ENGINEER: (For Esso Standard Oil Company) Mr. James B. Vason

CONTRACTOR: The Leo Butler Company, College Park, Md.

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As on so many important sewerage, drainage and industrial waste disposal jobs, UNIVERSAL Vitrified Pipe and TYLOX Gaskets "join up" to assure long-time, maintenance-free operation of this 24" line shown under construction at the Baltimore refinery of Esso Standard Oil Company.

Engineers and officials of this project can be assured of the wisdom of their specifications . . . petroleum by-products, nor any other corrosive elements common in sewerage and industrial waste lines, cannot deteriorate Universal Vitrified pipe, and the equally durable TYLOX Gaskets assure "no joint-leaks" for the life of the line.

In planning your pipe projects, take advantage of UNIVERSAL'S unbeatable combination for deterioration-proof, maintenance-free sewers and drains — Vitrified pipe and TYLOX Joints. Write us for more details, or contact the Universal-United States Concrete branch office nearest you.

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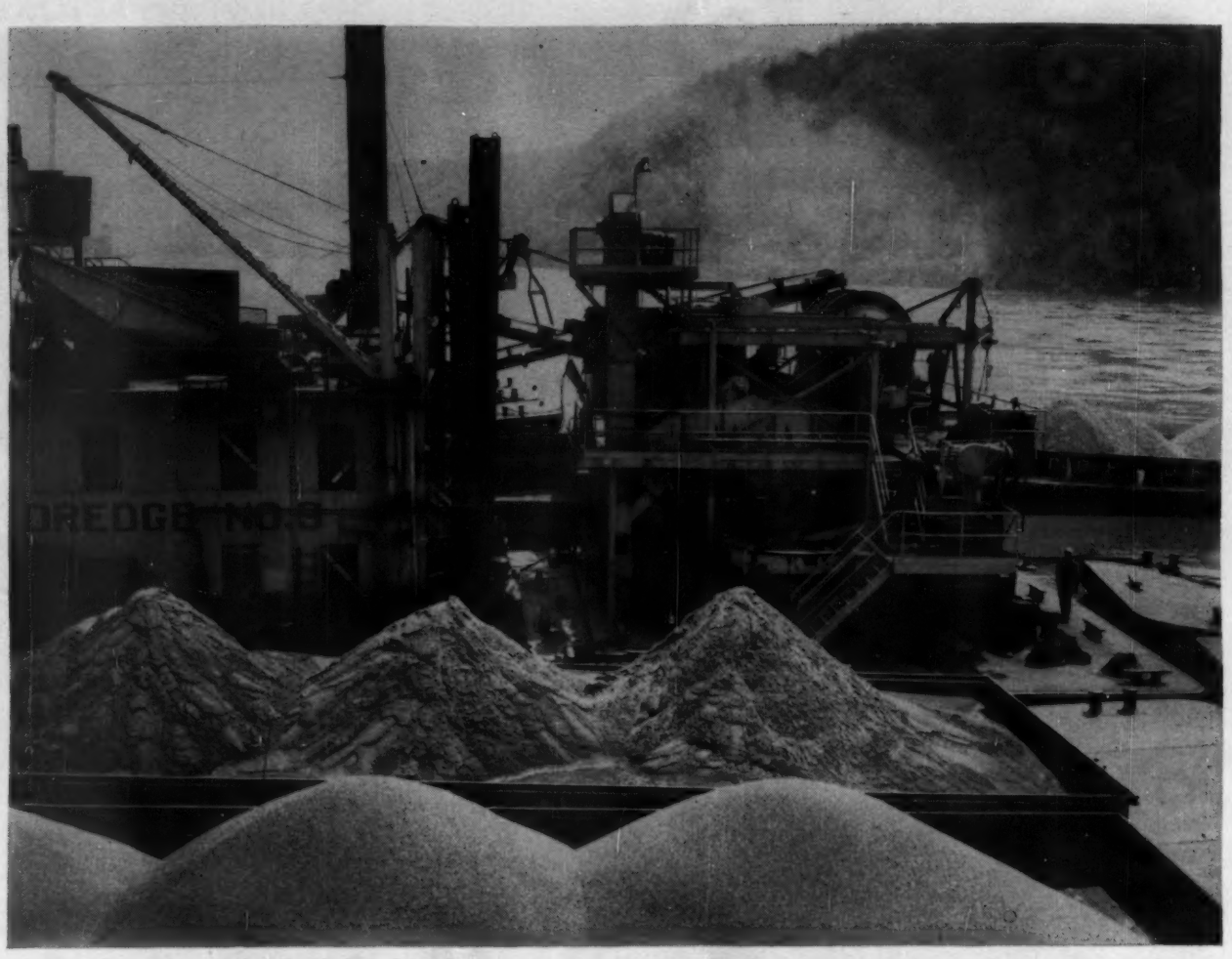
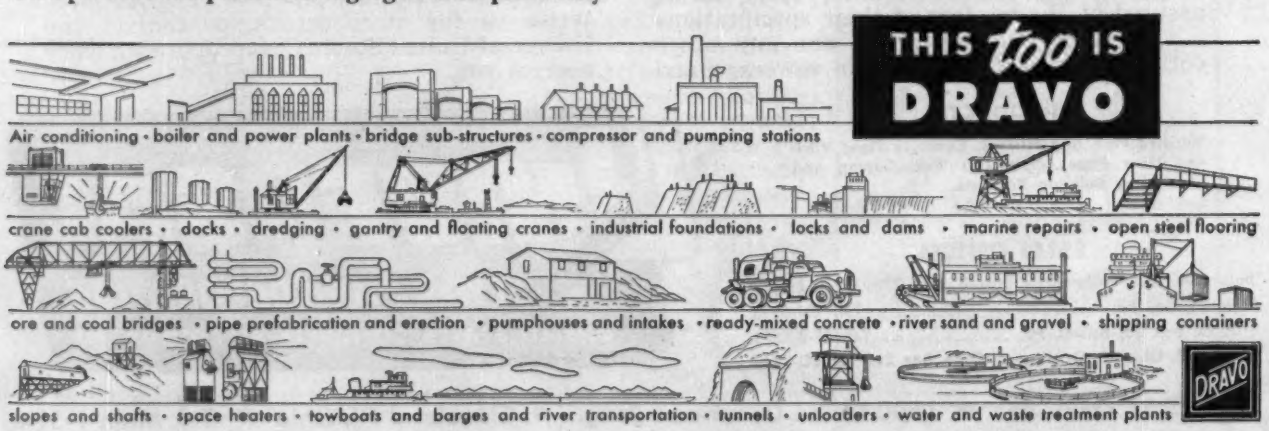


DRAVO'S HEAVY-MEDIA PLANT IMPROVES QUALITY OF GRAVEL

Following several years of experiments with various ways of gravel-processing to improve its performance in quality tests, river gravel is now being produced commercially in this country through the heavy-media process by the Keystone Division of Dravo Corporation.

The processing, carried on in a floating heavy-media plant which was developed and built by Dravo, places gravel dredged from the Ohio River into a heavy liquid of finely ground magnetite suspended in water. Objectionable particles of "soft" gravel, porous gravel and foreign materials, which are lighter than the heavy liquid, float to the surface and can readily be removed. This process also permits dredging in areas previously considered worthless because of contamination by coal deposits and other undesirable material.

Dravo's Keytone Division, largest producer of sand and gravel in the Pittsburgh area, also operates a towing service on the rivers and transports a substantial tonnage of coal on the Monongahela. Dravo takes pride in the part Keystone is playing in supplying sand, gravel and ready-mixed concrete to many of the projects in Pittsburgh's tremendous building program. Dravo considers customer satisfaction an essential element in all its products and services. DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.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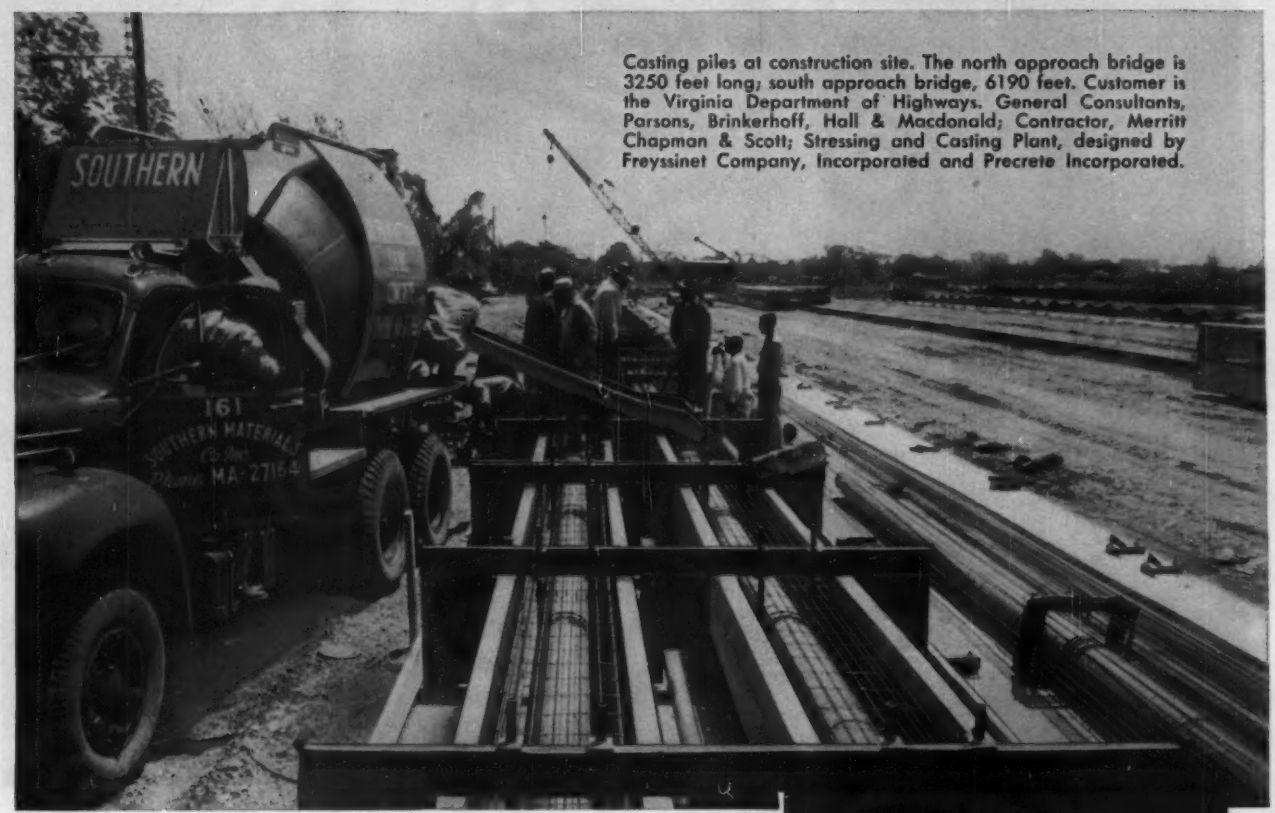
PRESTRESSED CONCRETE
FOR HAMPTON ROADS CROSSING



Casting piles at construction site. The north approach bridge is 3250 feet long; south approach bridge, 6190 feet. Customer is the Virginia Department of Highways. General Consultants, Parsons, Brinkerhoff, Hall & Macdonald; Contractor, Merritt Chapman & Scott; Stressing and Casting Plant, designed by Freyssinet Company, Incorporated and Precrete Incorporated.

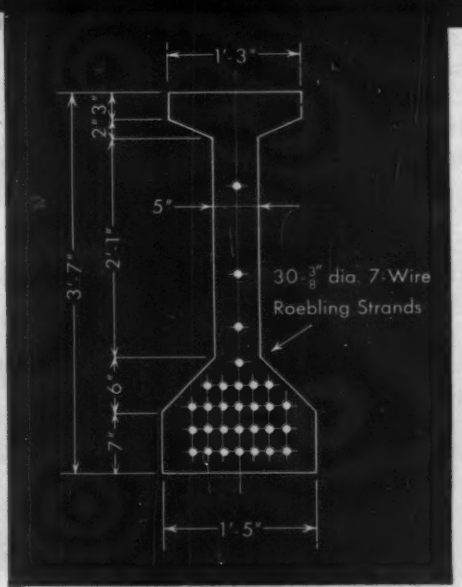
ON THE $19,500,000 bridge-tunnel project now under construction at Hampton Roads, Va., pre-tensioned bonded members are being used wherever the specification offers them as alternates to structural steel or post-tensioned members.

More than three million feet of Roebling ⅜" diameter 7-wire stress-relieved prestressed concrete strand are being used in piles and girders.

General technical data include:

Design load: H20-S16
Spans: 50'-0" c.c. pile bents
Girders: I section – 3' 7" depth at center and 3' 10" over piers on 5' 2" centers – each pretensioned with 30 Roebling ⅜" stress-relieved strands.
Piles: 24" square, 50 to 68 feet long with 10" cored hole, each pretensioned with 30 Roebling ⅜" stress-relieved strands. Five piles per bent, designed for two point pickup.

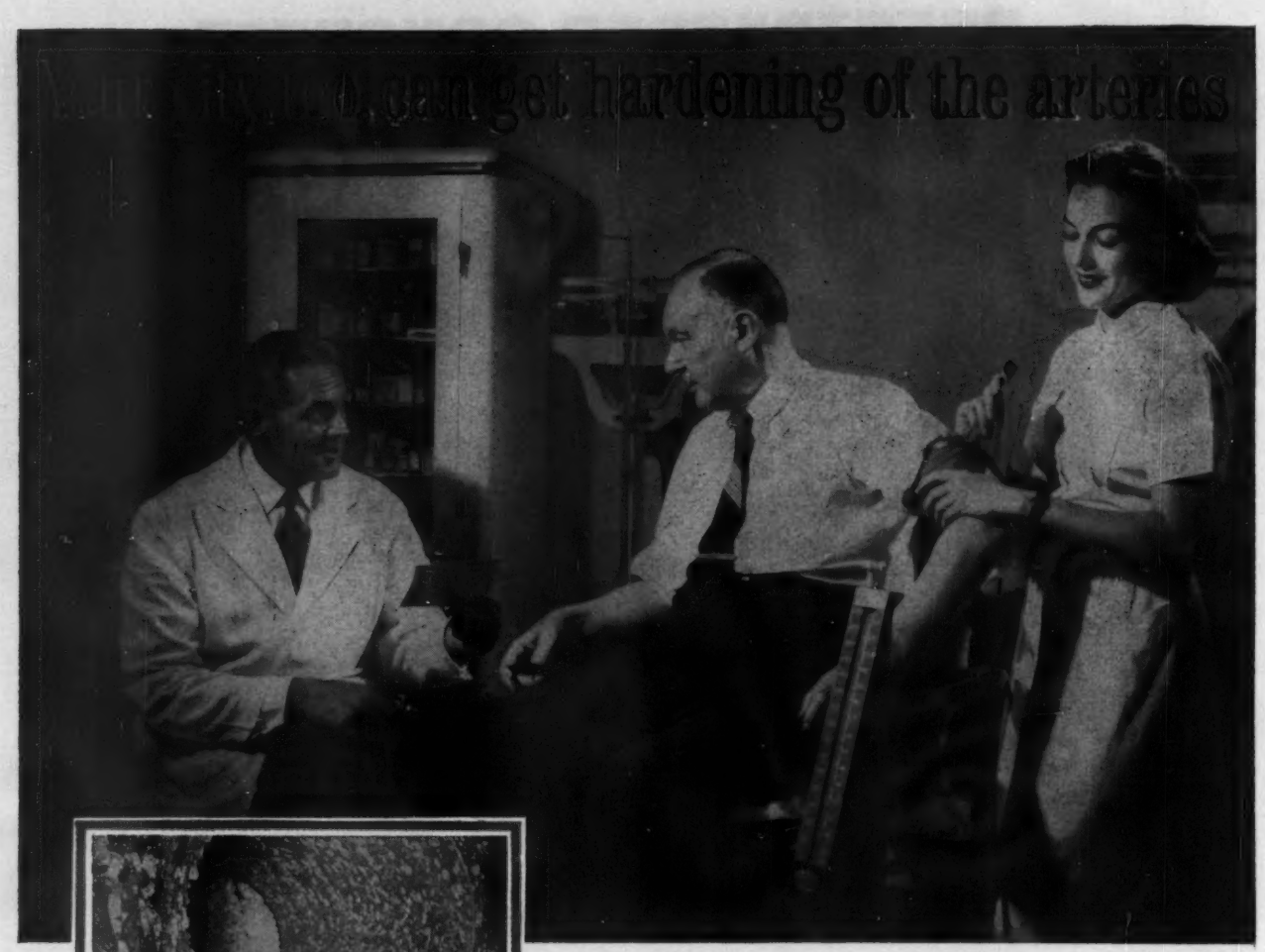
Roebling is America's leading supplier of tensioning elements, and Roebling engineers will be glad to give you full information on tensioning materials and fabrication methods. They are also ready to cooperate with you to help assure top efficiency on any specific application of this modern and economical structural material. Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.

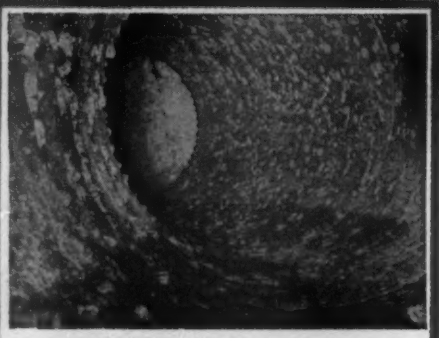


Cross section of girder at center of span.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation CFI





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TWENTY YEARS OF SERVICE HAVE NOT REDUCED THE ORIGINAL HIGH CARRYING CAPACITY OF THIS LOCK JOINT CONCRETE PIPELINE.

Water pipes, like blood vessels, can become congested and their efficiency seriously impaired by deposits on their inner walls. To avoid this "hardening of the arteries", far-sighted hydraulic experts insist on added protective linings for pipeline materials adversely affected by aggressive water.

Such costly protection is unnecessary in LOCK JOINT CONCRETE PRESSURE PIPE. The dense inner wall of this virtually ageless pipe is inherently immune to tuberculation, and consequently maintains its initial high carrying capacity *permanently*.

Its great durability and trouble-free service assure you the most economical and efficient pressure pipeline obtainable.

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ENGINEERING NEWS-RECORD

Vol. 155, No. 7 August 18, 1955

Number of copies printed this issue, 68,268

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THE CONSTRUCTION WEEK

MAKING PLANS—States and localities have been bothered for years with a "chicken-and-the-egg" problem in public works construction. Local units often could not get preliminary plans prepared or investigations made without bond funds or other public money. But, they couldn't get the money because they had no plans. Last year, Congress was persuaded to help out with interest-free loans that would be repaid as soon as construction started. But Congress did not appropriate as freely as it authorized, and the program got off to a slow start. This time, Congress had a change of heart, liberalized the program. (See page 21.)

CALL FOR ACTION—However, Congress was coming in for sharp criticism on another score—failure to enact the much discussed national highway program. Meeting in Chicago, delegates to the 47th annual Governors' Conference called Congressional inaction on highways "tragically short-sighted." Some strongly urged the President to call Congress back for a special session and the conference authorized a special committee of governors to work with the President and the Congress to get a highway bill enacted, "as soon as possible." (See page 21.)

ATOMS FOR POWER—While new atomic developments were being unveiled in Geneva, Switzerland, atomic power in the United States made some strides of its own. The AEC approved plans of two major private groups to build large-scale experimental nuclear power plants. Nuclear Power Group, led by Chicago's Commonwealth Edison Co., won AEC approval for a 180,000 kw plant, and the Detroit Edison group was told it will get a license for a 100,000 kw plant. But two other applicants were rejected. (See page 96.)

ALUMINUM EXPANSION—Steel, cement and lumber are the construction materials most watched by construction men. But a fourth material is worth a careful look. Aluminum, now winning acceptance as a structural material, is in short supply, because of an unprecedented demand. Expansion programs that run into hundreds of millions of dollars are under way as the aluminum industry tries to satisfy a market in which construction is now the biggest single customer. (See page 23.)

CANADIAN CEMENT SHORTAGE—Spotty cement shortages have plagued contractors in almost every section of the United States this year. To relieve the shortage, contractors have brought cement in from distant U.S. mills, and in some cases, from Mexico and Canada. Now a check shows that Canada is having its own troubles with cement shortages. Where is Canada getting the extra cement it needs? From Europe—and the United States. (See page 96.)

Which Armco Culvert is 48 Years Old?

These recent photos won't give away the secret. In fact, you can't tell the age of an Armco culvert just by looking at it. Armco Corrugated Metal Drainage Structures have an outstanding record for long, economical and efficient service.

Just for the record, the twin culverts (1) were installed in 1907. They are still giving good service today — even though two floods completely washed away the road over them. The MULTI-PLATE Pipe (2) was installed in 1932; the Michigan installation (3) has been in service since 1915; the PAVED-INVERT Pipe (4) since 1929. How close did you guess?

1. OHIO. Twin installation of Armco Pipe serves a busy road between Cincinnati and Dayton, Ohio.

2. NEW YORK. This 75" diameter Armco MULTI-PLATE Pipe still has good alignment.

3. MICHIGAN. Although this 84" diameter Armco Pipe supports part of the cracked headwall, it gives good service.

4. WEST VIRGINIA. To handle highly erosive drainage under Route 7, they installed this Armco PAVED-INVERT Pipe.

Long life is not the only advantage of Armco culverts. Corrugated metal design provides ample strength for any loading condition. Installation goes fast because, depending upon the Armco structure selected, assembly is either a matter of joining 20-foot-long sections with bolted coupling bands or bolting curved and corrugated plates together. Choice of protective coatings and pavements on pipe up to 96" in diameter helps solve problems of severe corrosion or erosion.

Size and capacity needs are easily met with the wide range of Armco Corrugated Metal Structures. A small crew, with no previous experience, can handle the whole installation. Armco Drainage & Metal Products, Inc., 4435 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO
DRAINAGE
STRUCTURES

ARMCO®

WASHINGTON OBSERVER

Tax aid for billions of plant construction is tied up while Office of Defense Mobilization makes up its mind about the future of the government's five-year fast amortization program.

All told, 19 kinds of plant expansion have been cut off from fast tax write-offs; 38 kinds of facilities have been suspended; and 20 categories have been continued.

Only facilities closely tied with military and atomic end-products are getting the tax aid now.

In total, applications involving some $9.3-billion of new plant capacity are caught in ODM's freeze. Not all these, by a long shot, had a chance for approval. But, even so, many businessmen will have to re-figure their plans—or at least hold off until ODM makes up its mind.

•

Best guess now is that many big users of tax write-offs won't get any more. For instance, electric utilities just before the suspension were given tax certificates on $300-million of new plant. Observers are betting that an additional $1.2-billion of utility expansion, for which applications are already in, will no longer be eligible when the new rules come out.

Reason: Tax benefit will be given only to plants tied closely to war goods. This would also rule out amortization for such things as iron and steel plants, oil refineries, pipelines, aluminum, and cement.

Politics has a part in this. Cut-back on tax benefits fits in with current worry about new round of inflation. Also, it would help in the drive of the Administration to come up with nearly-balanced budget to take to the voters next fall.

•

First approvals of new Reclamation Bureau projects has been given by the Administration. Construction will begin on 10 projects or units of projects totaling $350.5 million in six states. Congress voted $10.9 million to get building started.

These projects are among the new starts voted by Congress. You'll recall that President Eisenhower, in signing the legislation, warned that his Administration will go slow on letting contracts. So the Reclamation Bureau announcement is a sign that review is under way for both Reclamation and Corps of Engineer starts.

The new projects include the Palo Verde Dam on the Colorado River, the $220-million Trinity River Project; start of construction of Vaquere Dam of the Santa Maria Project; the Provo River power plant at Deer Creek Dam; Roza Canal power plant—a part of the Yakima Project; Yellowtail Dam in Montana; the Owl Creek Reservoir on the Missouri River Basin project.

•

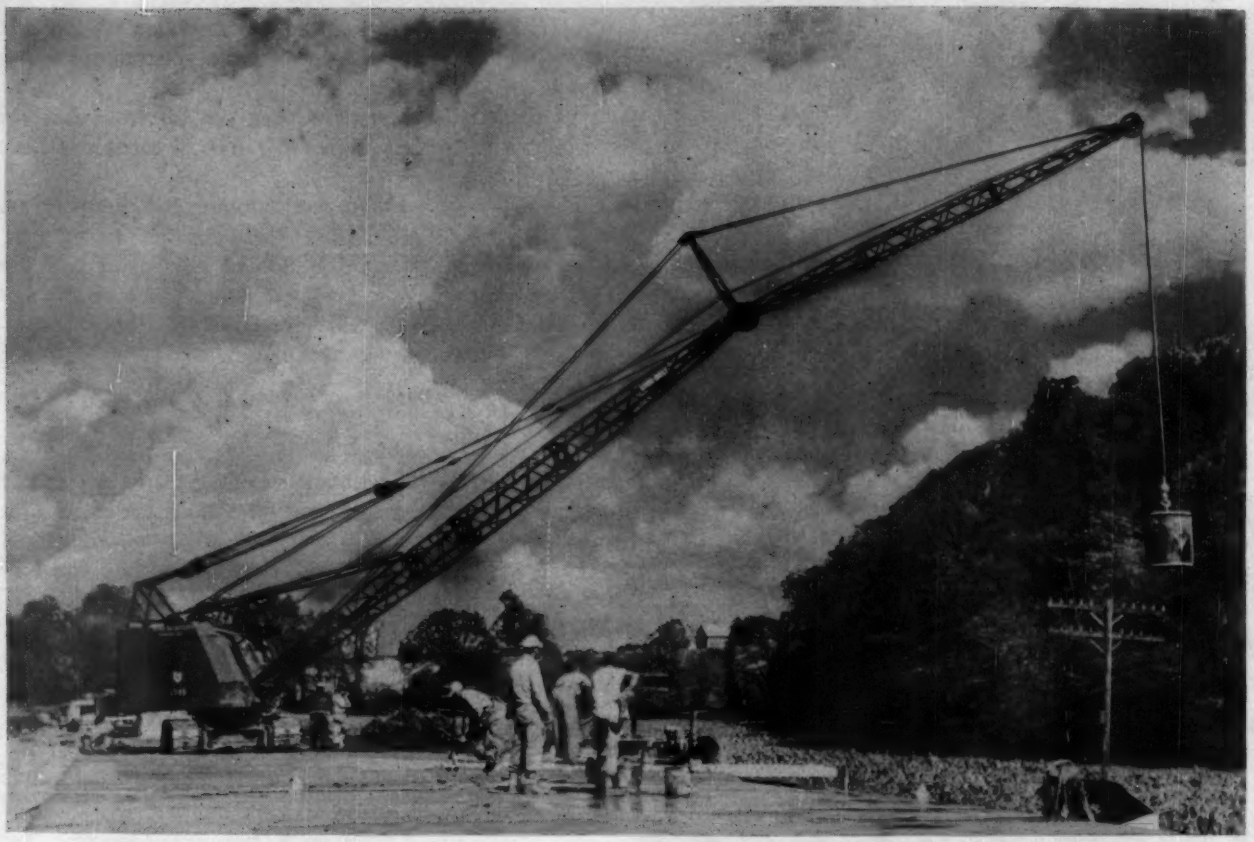
Army Engineers are beginning authoritative study on hurricane damage and what can be done in building to counter high winds and water.

$1-million was voted by Congress for the job—and a meeting was held in Washington this week to get the project under way. Weather Bureau is in on the study, too.

Work will be concentrated in New England, Long Island, and the Carolinas—which have been hit hardest in the last few years.

Objectives spelled out by Congress include ways of preventing loss of life and property, "with due consideration of the economics of proposed breakwaters, seawalls, dikes, dams, and other structures . . ."

Hiring has already begun in Boston for men to work up report on New England, hard hit in 1938 and last year.



FAR REACHING, NEW LS-88 uses jib to spot concrete bucket on road job. Patented high gantry is raised and lowered under power, one of many optional extras.

Long, wide and exceptionally stable crawler mountings and shoe widths are available to suit any heavy-duty, ¾-yard job. All clutches are interchangeable.

UP TO 25% MORE OUTPUT — Speed-o-Matic power hydraulic controls cut fatigue. No lag, jerk or strain.

AHEAD ON ½-YARD JOBS — It's the new LS-58, fastest, most powerful rig in its class, with "big-rig" features.

UP TO 99 NET HP FOR 1-YARD PROFITS — New heavy-duty LS-98. First time Speed-o-Matic in this class.

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TEAM up with the shovel-crane line that gives you the most productive capacity. It's the only line that offers you true power hydraulic Speed-o-Matic control, *and it's on every model.* Choose from many new models—with pace-setting improvements—in the ½ to 3-yard, 10 to 60-ton range. Equip for extra speed, power and work range—to bid successfully on more jobs—*and earn more on all of them.* See your Link-Belt Speeder distributor for complete facts, or write: Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

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More Planning Aid For Local Projects

Federal revolving fund of $48 million to be set up for loans to communities

The federal government will be more generous in loaning state and local agencies money to help defray cost of planning public works projects in advance of their construction appropriations becoming available.

Advance planning aid has been given a double assist by the new housing bill passed by Congress (ENR Aug. 11, p. 24). More loan money is to be made available and it is now to constitute a revolving fund.

Congress stepped up loan authorizations from last year's level of $10 million to a new total of $48 million over the next three years.

The recent liberalization of this program represents a change of heart for Congress, which appropriated only $4.5 million against a $10-million authorization last year.

• **Slow start**—Because of the small sum available last year, Commissioner John C. Hazeltine of the HHFA's Community Facilities Adminsitration imposed tight restrictions on advance planning loans.

CFA processed loans only for local public works that were urgently needed. And, CFA limited to $75,000 the amount that could be loaned to localities in any one state. These restrictions were lifted in April when it became clear that Congress was ready to vote more money for the program.

Even under the earlier limitation, CFA made headway in processing loans. The first loan, approved April 22, advanced $10,000 to Twin Falls, Idaho, to plan a $1-million sewage collection system.

Since April, ten more planning advances have been approved. The first 11 loans, totaling $94,000, will pay for preliminary planning of local public works estimated to cost more than $15 million.

Now other communities are applying for the federal loans, and the program is beginning to develop rapidly. Qualification statements, a prerequisite to submission of applications, have come in to CFA from 38 communities.

These 38 communities are asking for slightly more than $550,000 in federal loans to plan local public works projects that will cost nearly $55 million to build.

• **Interest-free loans**—Like last year's law, the 1955 legislation authorizes the HHFA Administrator to make advances to public agencies (state, regional or municipal) to aid in financing the cost of both preliminary plans and working drawings for construction of public works.

There are a few limiting provisions. Each project must be planned to be constructed within a reasonable time and it must conform to an overall state, local or regional plan approved by a competent agency.

Federal planning advances are repaid—without interest—by the local public agency when construction is started on the local public works project. If the local agency undertakes only part of the work, it repays only a proportionate amount of the loan at that time. But, if repayment isn't made when due, the local agency is charged 4% interest on the unpaid amount, beginning with the due date.

The $10 million authorized in the 1954 law is expected to finance the program until June 30, 1956, the end of the current fiscal year. HHFA plans to ask the Budget Bureau to approve a supplemental appropriation to add to the $4.5 million already voted.

Under the 1955 legislation, Congress authorized a three-step increase in the revolving fund: $12 million on July 1, 1956; another $12 million one year later; and a final $14 million July 1, '58.

Airport Aid Allocations

States and cities last week received their first installment on an expanded federal-aid airport program that will generate $125 million of new construction during the current fiscal year.

Commerce Secretary Sinclair Weeks allotted $20 million of federal funds, to be matched 50-50 by the states and localities. Still to come is an additional $42.5 million that the Civil Aeronautics Administration is holding until September or October—to permit sponsors to adjust their project applications for bigger and longer-range development plans made possible by the new program (ENR July 28, p. 21).

Congress authorized $250 million of federal aid to be appropriated at the rate of $62.5 million a year for four years. Local matching funds build up the four-year kitty to $500 million.

Governors to Spur Action on Road Bill

But State Executives are as far apart as Congress on methods of financing

Failure of the 84th Congress to enact legislation for an urgently-needed multi-billion national rebuilding program drew sharp criticism at the 47th annual Governors' Conference held last week in Chicago.

Branding Congressional inaction on the highway program as a "tragic failure", some governors expressed the opinion that Congress should be called back into special session to enact a highway program that could get under way immediately.

This view was offered to the conference in a prepared statement by Gov. Walter J. Kohler, of Wisconsin, moderator of a panel discussion on highways and highway safety, in which more than 15 of the governors participated.

"The staggering estimates of anticipated traffic on American highways during the next decade and the vital importance of our highway system to the national commerce, and more particularly, to the national defense, make an expanded federal highway program urgent and necessary," Gov. Kohler said.

"There is no question in my mind," the governor added, "that Congress has a responsibility to act in the highway field and that the vast majority of American citizens want and expect it to act. That legislation of such vital importance should be abandoned because of the inability of the Congress to agree on a program to finance it, is tragically short-sighted."

• **Cities toll roads' success**—Experience has shown not only that the people are willing to pay, but to pay rather handsomely for the privilege of driving on safe, modern highways, Kohler asserted. He pointed out that almost without exception, toll road projects have realized tremendously-increased traffic volume years ahead of schedule.

Similar views were expressed from the floor by other governors who also warned that rates on toll road bonds may be raised to the point where success of toll road programs might be impaired. One safeguard they suggested would be to get the federal government to join states on guaranteeing

. . . Governors

bonds to assure the rates would be reasonable.

The governors were agreed on the need for a prompt start on a mammoth road-building program. But there was sharp disagreement on the length of time to complete the job.

Oregon's Gov. Paul L. Patterson recommended a 15-year highway plan to ease current criticism of financing costs. But Gov. William G. Stratton, of Illinois, host governor of the four-day meeting, urged a five-year program to help reduce the increasing rate of highway fatalities.

Stratton predicted that highway engineers, contractors, equipment manufacturers and materials producers would be able to meet the tremendous challenge of a five-year program.

• **Highway resolution**—Some governors at the conference continued to urge that the federal government repeal its taxes on motor fuels, "retire" from roadbuilding, and let the states build their own highways with increased state gasoline taxes. But they see little chance of this happening.

As outlined by Gov. Theodore R. McKeldin, of Maryland, a member of governors now feel the federal government should return to the states for highway purposes a far greater proportion of the tax money it collects from highway users. McKeldin commented, "The national administration's $101-billion state-federal highway construction program was designed to do that".

He urged the conference to take a strong stand for revival of the administration bill; and against federal increases in highway use taxes.

But the highway resolution finally passed by the conference hedged on the question of financing the road-building plan.

Noting that it "will take the combined and co-operative action of the President, the Congress and governors of the various states" in order to get a national highway program, the Governors' Conference reiterated its approval of a greatly-enpanded federal-state program for construction of interstate highways, and authorized appointment of a committee of governors to help in any way possible.

The resolution also pointed out that present federal motor fuel and excise taxes produce more than $2.5 billion in revenue annually, and that only $900 million of this money is devoted to highways.

"In view of this imbalance, the conference went on record as registering a strong request that far more of this automotive revenue should be expended on highways. . . ."

A Material That's Going Places

Aluminum industry charts big expansion as new uses for the metal multiply, with construction applications in forefront

The aluminum industry is betting its blue chips—several hundred million dollars for expansion—on a rising market in which the construction industry is now the No. 1 customer.

Construction is not the only factor in the drive for expansion. Demand for aluminum is outrunning supply for a number of reasons. Government stockpiling of the metal diverts a substantial chunk from the civilian market. The general pick-up in business, starting in the third quarter of '54, caught the industry with low inventories and helped to create the present "scarcity". And, because the supply of copper has been tight, many copper users have switched to aluminum. These are all important. But another prime mover in the unofficial third round of aluminum expansion has been developed of new uses for aluminum. Almost every metal-using industry has found new applications for aluminum in recent years, and construction has been in the forefront the aluminum-using industries, vying with transportation for top honors.

"The greatest growth of aluminum applications has been in the building field since World War II," one top official told ENGINEERING NEWS-RECORD. This official, and many others, feel that the increasing use of aluminum as a structural material has been one of the most significant developments in the industry in the past 15 years. Said one: "Aluminum has come of age as a structural material. . . ."

• **The most is not enough**—Aluminum is setting new production records almost monthly, turning out more metal than at any other time in its history. But it isn't enough to match demand. Production, which stood at 718,000 tons in 1950, has climbed to 1,520,000 tons today. By 1960, capacity is expected to reach 3,000,000 tons.

Extrusions, for which the construction industry is a prime customer, are booked through the fourth quarter at most mills. "If you ordered some extrusions now, the earliest you could get delivery would be in January," according to one company spokesman.

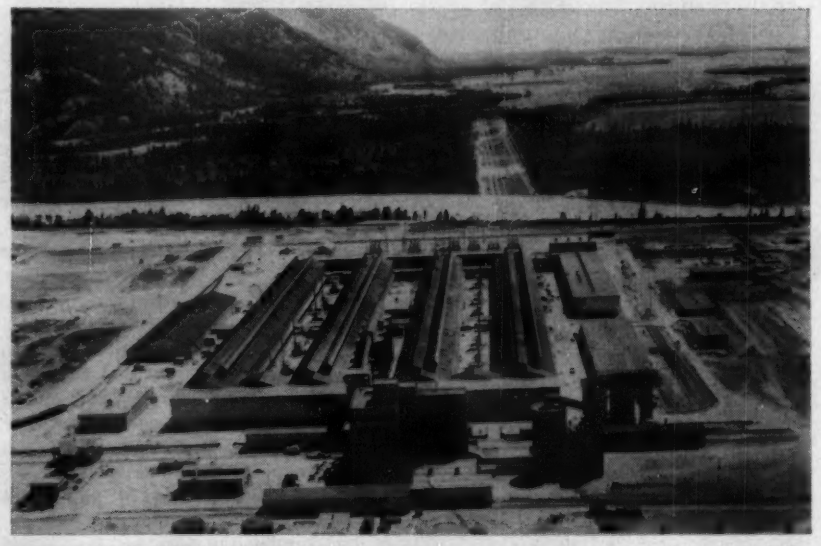
Because of the aluminum supply shortage, the Office of Defense Mobilization has been asked to take action on two fronts. It has done all it can on one of these: A total of 200,000 tons of aluminum has been deferred from delivery to the stockpile for the third quarter and from many shipments in the second quarter.

The second step is still awaited. ODM must make a decision on a government-sponsored round of primary aluminum production expansion. This decision has been postponed a number of times since late June because of policy dissension within the agency.

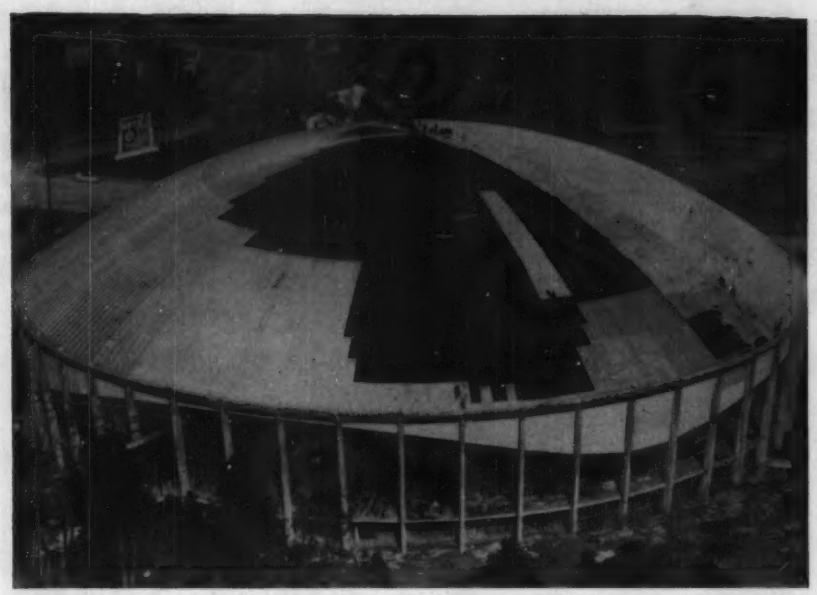
On Thursday of last week, ODM temporarily suspended approval of new applications on aluminum plants, awaiting the final decisions.

However, industry is going ahead on its own.

This week, Anaconda Aluminum



A NEW PRIMARY ALUMINUM PLANT was opened this week at Columbia Falls, Mont., by Anconda Aluminum Co., first new producer to enter the primary aluminum field since 1946. The $65-million plant will produce 60,000 tons a year.



STRUCTURAL USES for aluminum are varied. One example is this dome-shaped aluminum roof for an ultra-modern coliseum at Charlotte, N. C. Dome surface consists of 3,665 pieces of aluminum, supported by a steel-ribbed web frame, stretching in a convex latticework from a steel tension ring around the circumference of the dome to a central compression ring. The tension ring, which absorbs the thrust of the arched roof ribs, is 2 in. thick, 32 in. wide and 1,000 ft in circumference. Central compression ring has a diameter of 46 ft.

Co. formally opened a $65-million plant at Columbia Falls, Mont., seven miles northwest of Hungry Horse Dam, which will be the plant's power source. Anaconda is the first company to enter the U.S. aluminum field since 1946.

By the first of the year, Anaconda hopes to have its new plant operating at full capacity—60,000 tons a year.

The Big Three of aluminum also are planning new facilities.

Reynolds Metals Co. has expansion under way at two plants. They will increase capacity by 10,000 tons a year at Gregory, Texas, and 25,000 tons a year at Lister Hill, Ala. The firm also has announced tentative plans for a new 100,000 ton plant in the Ohio River Valley, probably in western Kentucky.

Kaiser is expanding its Tacoma, Wash., plant by 5,300 tons and is planning an expansion of 95,000 tons at an undisclosed location.

Alcoa is adding 45,000 tons capacity to its Rockdale, Texas, plant and 20,000 tons to the Point Comfort plant. This new capacity will be on the line by the second quarter of next year, according to Alcoa officials.

• **More producers possible**—The long-range supply of aluminum may be boosted not only by the present producers, but also by "newcomers". If ODM decides to offer incentives, possibly guaranteed loans or markets, in addition to fast tax writeoffs, new producers may enter the field.

Harvey Machine Co. would like to build a 54,000 ton plant near The Dalles, Ore.; Olin-Mathiesen Corp. has tentative plans for a 60,000 ton plant near Morgantown, W. Va.; St. Joseph Lead-Pittsburgh Consolidation Coal Co. would build a 66,000 ton plant at Wenatchee, Wash.

Several new alumina clay processing plants have been planned by Kaiser and Reynolds to supply ore to their new smelters. Kaiser has planned a $52-million alumina plant in conjunction with its proposed 95,000 ton aluinum ingot plant, which will also cost about $50 million. Reynolds has planned a 200,000 tons alumina plant in conjunction with its 100,000 tons proposed aluminum ingot plant.

• **Major construction supplier**—How important is aluminum to the construction industry? Aluminum is not in the steel industry's class from a production standpoint. But it is important by other standards. Statistics are sometimes elusive in this fast-growing industry. But some are available and they tell an interesting story.

Building materials and construction took 23.6% of all the aluminum available for civilian use from 1950 to 1953, according to the Business and Defense Services Administration of the Department of Commerce.

Building materials alone accounted for 17.5% of the civilian total, running well ahead of consumer durable goods and transportation, the next largest users, each of which took 14.8% of the civilian total.

Aluminum storm windows and screens, as might be expected, count heavily in the totals. But the list of aluminum uses in the construction industry is long.

Plumbing fixtures and fittings, oil burners, boilers, water heaters, ladders, partitions and encloseures, builders hardware, prefabricated dwellings, roofing, structural metal work, prefabricated and portable metal buildings, and pipe are just a few.

In 1952, when an accurate check was possible under the Controlled Materials Plan, building materials used 341,020,000 pounds of aluminum. And, construction machinery accounted for some 6,246,000 pounds of aluminum that year.

One leading aluminum official told Engineering News-Record this week that the construction industry now takes between 600,000,000 and 700,000,000 pounds of aluminum a year. That's just about double the amount used by the construction industry only three years ago. Roughly a third of this goes into homebuilding. The balance goes to commercial building, industrial building and highways (aluminum is widely used for handrailings, signposts, etc.).

• **More structural use**—Aluminum will be an even more important construction material in the years ahead, as structural uses increase. The consensus is that the really big market in construction has not been tapped yet.

While the aluminum-clad Alcoa Building in Pittsburgh is a showpiece—and a salesman for the industry—skyscrapers are not counted on for any substantial tonnage, according to some officials.

One explained that the Alcoa Building probably did not use more than 4,000,000 pounds. And, Alcoa Buildings are few and far between.

"Our big market will be the three or four-story office buildings," this official said. "For every high-rise building, there are hundreds of these smaller multi-story buildings being built; we are convinced that more and more of them will be built with aluminum."

With this—and other construction markets unfolding—some industry observers think that tonnage for the construction industry will double again within the next five years.

And, in private conversations, aluminum officials have some more good news for construction—the price of aluminum probably will be steady for some time to come.

"We can't afford runaway prices for a few quick profits—even when demand is ahead of supply," said one official.

Bay Area Bridge

First timetables set for construction of new span across Carquinez Straits

A tentative timetable has been set up for construction of the $47-million Carquinez Straits Bridge, which will parallel an existing bridge linking two arms of San Francisco Bay.

The new toll bridge and freeway approaches, totaling 9 mi, were authorized by the California legislature at this year's session (ENR June 16, p. 23).

There will be a total of six contracts for construction of the bridge and freeway approaches. These will be followed by a seventh for resurfacing and repairs to the existing bridge when traffic is diverted to the new structure.

The first four contracts, to be advertised Oct. 14, are scheduled for completion in July or August 1958. They include:

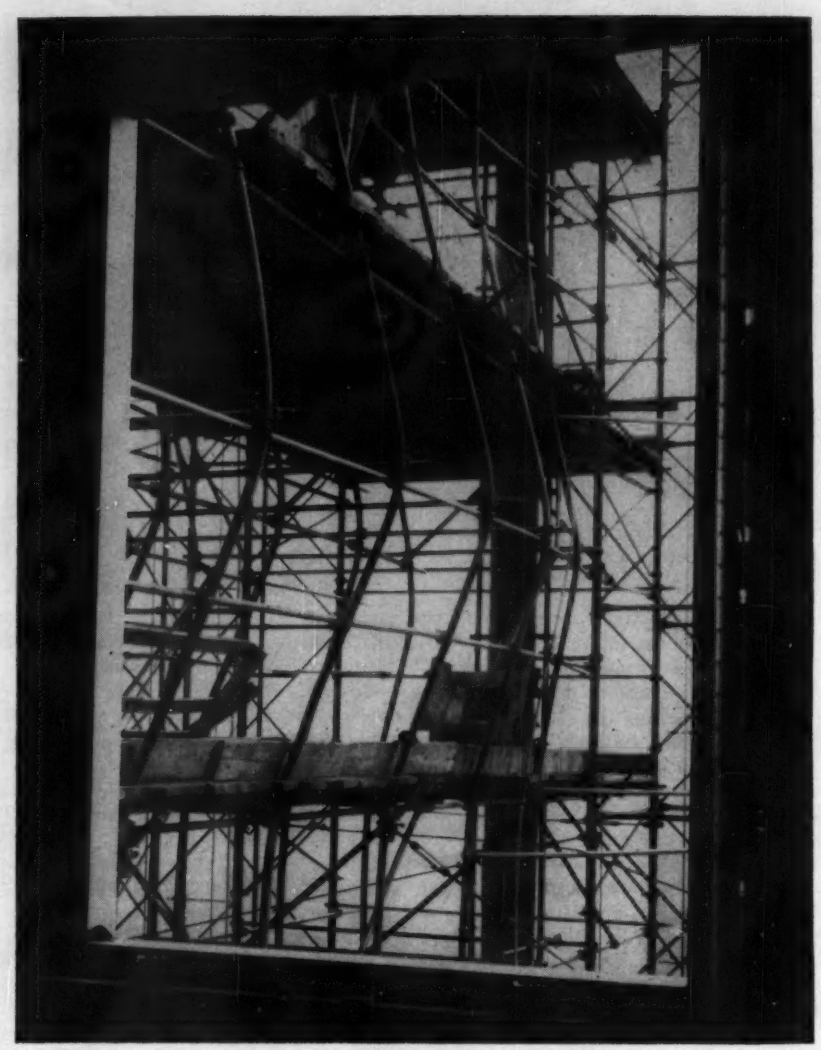
- Foundations and substructure work for the main bridge across Carquinez Straits.
- Superstructure work for the main bridge.
- Approach spans and interchange ramps in Crockett.
- Approximately 2 mi of freeway work, including eight structures and the "big cut." The cut will involve 8,000,000 cu yd of earth and will be some 300 ft deep at the highest point and ¼-mi wide.

•**Vallejo freeway**—The remaining two contracts will provide for construction of 4½ mi of freeway through Vallejo. The first of these contracts will be advertised in April 1956. It will include the toll plaza and administration building as well as widening of the Vallejo Wye structure. The second portion will be advertised in September 1956, and includes interchange structures. In addition, there will be a separation structure to be advertised this September.

As soon as traffic is diverted onto the new structure, ramp and approach connections will be made to the existing bridge. Then repairs will be made to the existing deck, curbs will be constructed to provide a 34-ft 4-in. roadway, and the existing slab will be resurfaced.

This work will be advertised enough in advance of completion of the new bridge to allow steel to be fabricated and to permit the contractor to have equipment and men ready to move onto the job.

Completion of the bridge and approach projects is scheduled for early 1959.



A Buckle That Did Not Become a Break

Last week when these pipe columns bowed out several feet without warning nearly halfway up the structure supporting 40-ft-long walkways from the curb-side hoist towers being used in the construction of the new 45-story Socony Mobiloil Building in New York, the upper part of the structure settled about 7 in. But it came to rest without further damage, since none of the clamped joint connections parted and since it was joined to the building at each floor level as well as being tied back with cables at frequent intervals. First repair operation was to pick up the weight of the structure above the bends with steel cables hung from the building. Then, since the bends occurred just above where the column section changed from 3½ to 2½ in. dia pipe, two new 2½ in. pipe columns were installed on each side of each bent pipe. These new columns were extended several levels above and below the damaged area. More diagonal bracing also was put in, and the structure was back in service three days later. Both the city building department and the Chesebro-Whitman Co., which leases the structure to the contractor, Turner Construction Co., are investigating the failure to determine what could have been done to prevent it.

Navy Rejects All Bids On Spanish Base Seaport

Because of an apparent error in the low bid, and the considerable disparity between the second low bid and the engineers' estimates, all bids for harbor work at the port of Rota, Spain, have been rejected. The project will be readvertised, with a bid-opening probably late in September.

Low bid was submitted by Corbetta Construction Co., of New York, in association with Construcciones Civiles of Madrid, at $12,768,472. Second low bid was $22 million. The great divergence between the two bids prompted Brown-Raymond-Walsh, joint venture prime contractors, to investigate, and it was found that several errors had been made on the low bid. Second low bid was so much higher that the contract could not be awarded automatically.

$500,000 Gamble

Edmonton city engineers reject contractor's bid, take on tough tunnel job

The city engineers department in Edmonton, Canada, has taken a "do it yourself" stand on the difficult—and financially risky—tunneling phases of the city's $6-million sewage modernization project.

The project involves burrowing a 9,000-ft tunnel 130 ft below the ground. The department, after studying problems arising from bad ground conditions on the city's north side, decided against reopening bids on the work. Instead, city engineers will take on the job.

The project is viewed as a half-a-million-dollar gamble. This $500,000 savings-or-loss represents the difference between the $1.6-million low bid submitted last spring by a private contractor and the city's own estimate. (The low bid was submitted jointly by A. A. Voice Construction Co., Ltd., of Edmonton, and Hugh Construction Co., of Chicago.)

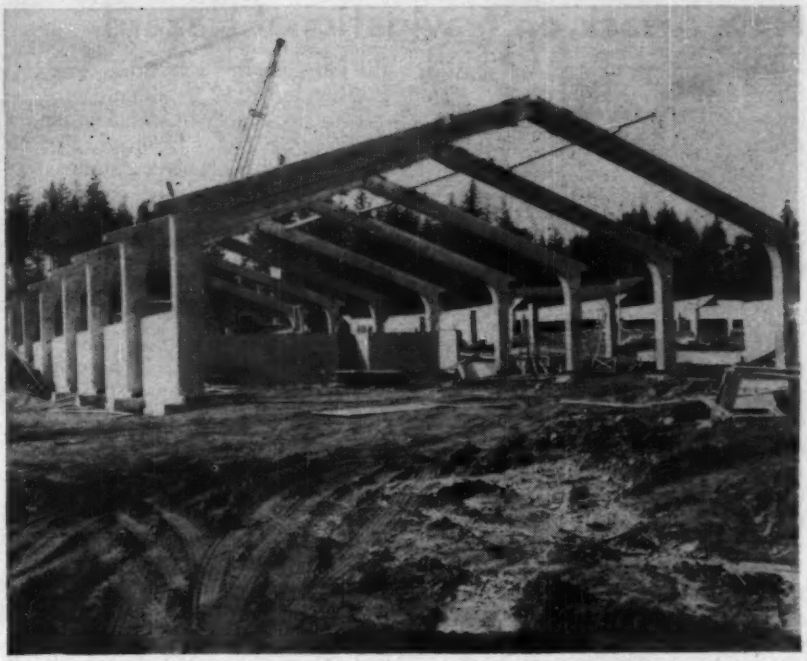
• **Danger from sand**—It is known that bad sand conditions will be encountered—and this holds the answer to whether the city will save money by carrying out the job itself.

In taking over the task, the city set a Nov. 30 deadline for completion of its portion of the job. This involves six 10-ft wide shafts going down 130 ft at 1,300 ft intervals, and two horizontal shafts cutting into the river bank at the ends of the sewer line. In hope of meeting the November deadline, the city will have five crews of 30 men working three shifts a day.

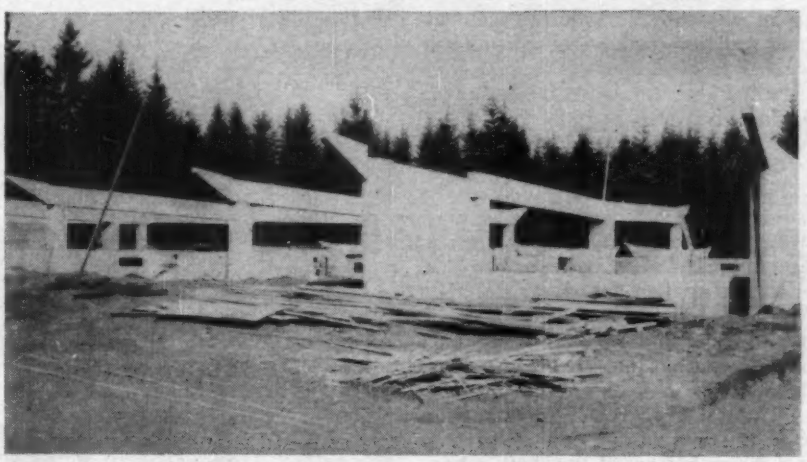
• **Problem from pipe**—As the tunnel goes forward, corrugated steel plates will be bolted into place, and circular pre-set concrete sewer pipe will be installed by sections inside the steel plates. Grouting then will be done on the outside.

The city selected this method over the "inner circle" procedure for several reasons. For one thing, the engineers have experience with the method decided upon, whereas use of the elliptical-shaped pipe, called inner circle, has not been thoroughly tested in Edmonton in bigger sizes. Eight-inch diameter inner circle has been successfully used. But this project calls for a 78-in. inside diameter and engineers are afraid time might be lost in attempting to push it through.

R. C. Dilke is the engineer in charge of the project. Job foreman is Robert Adams, who has specialized in tunnel work for 40 years.



PRECAST CONCRETE ARCHES helped cut costs for multi-purpose building that is part of a new school plant north of Seattle, Wash.



CLASSROOM BUILDING GIRDERS, also precast concrete, are 39 ft long, weigh 9,300 lb each.

Precast Concrete Lowers School Costs

Precast concrete is being used extensively to lower costs of the Maple Park Elementary School now under construction for the Edmonds School District, north of Seattle, Wash. According to architect William Arild Johnson, of Everett, Wash., the district will have a Class A fireproof school plant at a cost of $12.10 per sq ft.

The school plant consists of three buildings—one multi-purpose building and two classroom structures. Precast concrete arches were used for the multi-purpose building and precast reinforced concrete girders were used for the two flat-roof classroom buildings.

The triple-hinged arches have an 80-ft span with 21-ft spacing. Each of the eight arches is 24 in. wide, 16 in. thick. The precast reinforced concrete girders are 39 ft long (32 ft between supports, with a cantilever at each end), and weigh 9,300 lb. each. Precast concrete roof slabs, 4x28 ft in size, cover the 22 classrooms in the classroom building. Roof slabs for the multi-purpose building are 5x21 ft. The multi-purpose building includes a covered play area at one end, and an auditorium at the other end. Associated Sand & Gravel Co., Everett, did all the precasting. Erection was handled by Newland Construction Co., under a $297,000 general contract.

New Attack on Navigational Hazard

A new attempt to blast Ripple Rock from Seymour Narrows near Vancouver in British Columbia is to be made next year by the Canadian Public Works Department. Twice in the past, the combined efforts of construction and mining men to remove this navigation hazard have failed, due to the swift and rapidly changing currents that sweep through the Straits of Georgia.

Ripple Rock actually is made up of twin peaks 450 ft apart with their tops 10 and 20 ft below the surface of the narrow channel through which all ships using the "Inside Passage" must go. In 1943, an attempt was made to drill and blast the tops off these peaks from specially built barges anchored by heavy cables (ENR July 1, 1943, p. 27). After an entire summer's work that project was abandoned. The barges were tossed around so constantly by the swift tidal currents, despite heavy concrete anchors, that no significant amount of drilling could be done.

Subsequently, drilling was attempted from barges secured to heavy cables suspended over the channel. Results were no better than in the earlier attempt.

• **Underground approach**—Now it is proposed to attack the problem by an underground route, as was done when similar hazards were removed from the Hell Gate Channel at New York more than 50 years ago. Use of that method was proposed by a prominent Canadian mining engineer in 1942 but abandoned because of no bidders.

These new plans call for sinking an 8 x 16 ft shaft at one side of the channel. From bottom of the shaft, a horizontal tunnel 8 x 8 ft will be driven out under the channel about 2,000 ft at a point midway between the two peaks of Ripple Rock. From there an inclined shaft would be driven up into each peak. Small side tunnels from these inclined shafts would be loaded with explosives to permit blasting off the entire top of each peak to provide a channel depth of 40 ft.

Plans call for use of about 550 tons of Nitrone, a new explosive recently developed by Canadian Industries, Ltd. This new product can be packed in cans and will withstand dampness; it will not be neutralized by water leaking through into the tunnels. When all holes have been loaded, the whole mass of explosives will be fired in a single blast to shatter the two peaks.

Bids on this work have been called for Sept. 28, and it is hoped to have the job done in 30 months. The cost is estimated at $2.5 million.

The work is to be done under the direction of Victor Dolmage, a geologist whose services were employed recently on the Kemano underground power plant project.

Two Housing Bills Vetoed By Governor of Wisconsin

Two bills that would have sharply curtailed the Milwaukee Housing Authority's powers—and could have resulted in its abolition—have been vetoed by Wisconsin's Gov. Walter Kohler.

Both bills were written on a statewide basis (ENR Aug. 11, p. 22), but would have had particular application to Milwaukee.

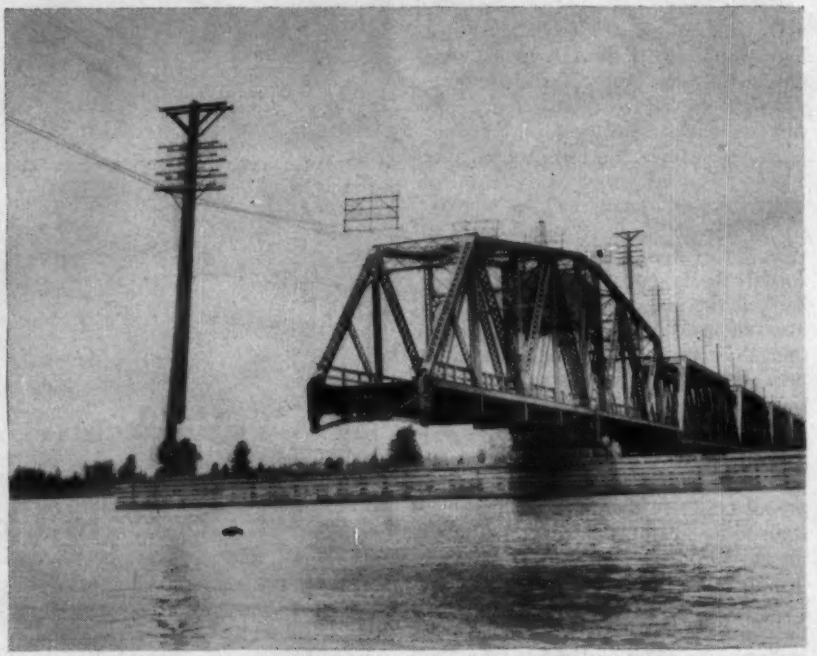
The first measure would have given the Common Council complete control over the housing authority, its budget, employes and operations. It would have enabled the council to abolish the authority and dispose of its housing projects.

The second bill would have required referendum approval before construction of any public housing project that did not pay full taxes.

In returning the first bill to the legislature, Gov. Kohler said he was convinced that it would halt any future slum clearance or housing projects in Milwaukee. He pointed out that if the bill became law the threat of dissolution of the housing authority would adversely affect the marketability of housing authority bonds to finance projects. (The veto has cleared the way for a January sale of $5.5 million in housing authority bonds for an addition to the Hillside Terrace low-rent project that is now under construction.)

In his veto message on the second bill, the governor pointed out that the bill would require referendum approval of every proposed housing project, even those where payments were made in lieu of taxes.

Under present law the Common Council must approve all housing projects and can seek the advice of the voters by holding a referendum if it desires.



Flood Waters Sweep Away a Bridge Span

For the second time in seven years a span on the 50-year-old bridge at Mission, B. C., has suddenly slipped into flood waters of the Fraser River. Last month's washout involved a 150-ft span and the northern pier of the 1,740-ft-long rail and highway bridge, which is owned by Canadian Pacific Railway.

During the flood of 1948 it was a 75-ft section at the opposite end of the bridge that collapsed and was carried away by the raging river. Blame for the latest casualty has been pinned on swirling eddies and currents. The concrete piers had been laid on top of rock-fill encased by wooden piling. Divers found that scouring had been so great that it had washed away all the rock-fill under the northern pier. CPR engineers plan to study the river bed before deciding whether to build a new bridge or to replace the span. The three-month job of replacing the washed out section and strengthening the remaining piers could cost more than $500,000.

BRUSH

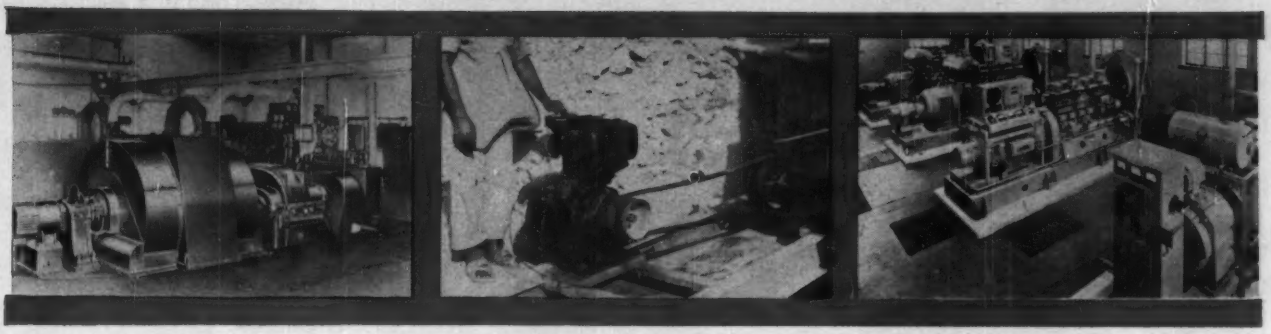
ZULULAND
Brush 2500 KW back pressure steam turbo-generator set installed in sugar mill.

Petter

PERSIAN GULF
Petter 5 HP aircooled diesel driving well pump. (A Shell photograph)

McLAREN

THAILAND
McLaren/Brush 55 & 85 KW diesel generator sets for rural electrification scheme.



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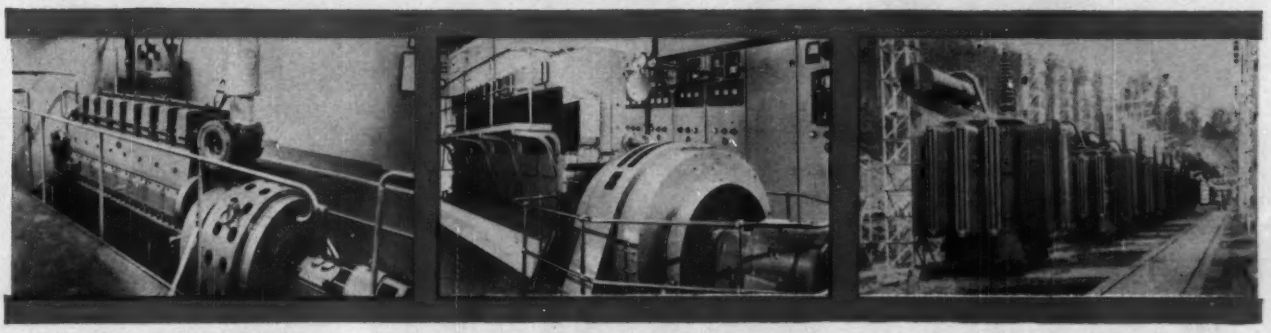

National

SOUTH AFRICA
National R4AU8 400 KW diesel generator set installed in a newsprint plant in Capetown.

Mirrlees

BRAZIL
Mirrlees/Brush KS8 1040 KW 400 RPM diesel generator sets with Brush switchgear installed at Santa Lina.

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Toll Authority May Be Used To Build Cape Fear Bridge

It may be necessary to create a toll authority to finance a badly needed high-level bridge over the Cape Fear River at Wilmington, N. C., State Highway Chairman A. H. Graham said last week.

Engineers have estimated the bridge and connecting roads would cost between $10 million and $12 million. Graham said the project could not be financed from Highway Commission funds.

The present Cape Fear and North East Bridges at Wilmington were built in the early 1900s. Graham pointed out that these bridges were not designed to handle the heavy traffic now being generated in the Wilmington area.

North Carolina worked for years to rid its public highway system of tolls. The state now has no toll roads or toll bridges. Burt Graham commented, "I think we have a different situation than usually is involved in highway projects."

One special authority was created to build a coastal road from Nags Head to Virginia Beach. But this authority has been unable to market its bonds.

City Charges Contractor Used Inferior Material

The City of Seattle, Wash., has filed a $707,471 damage suit in King County Superior Court at Seattle against Kuney-Johnson Co., charging the firm used inferior substitutes in construction of the 15-story Public Safety Building.

The city's complaint alleges that the contractor substituted Perlite, known as Dantor lightweight plaster aggregate, for the sand which was specified.

This has resulted in "deflection in ceilings, raising of partition panels from floor surfaces, severe fractures in walls, ceilings, ceramic tile and glass-

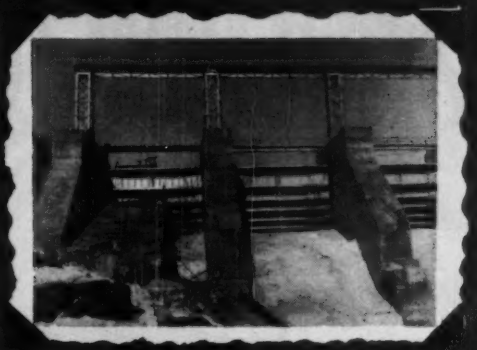
(*Continued on page 32*)

Factory Turns Out Record-Breaking Beams

What are claimed to be the world's largest factory-produced pretensioned reinforced concrete I-beams have been placed for a roller rink-bowling alley near Tacoma, Wash. The eight beams used in the two-story structure are nearly 87 ft long, 2 ft wide on the flange, 4 ft deep and weigh 57,000 lb. They were prestressed to 500,000 lb and contain sixteen ½-in. stress-relieved strands. Since the $210,000 contract awarded Bona Fide Builders, Inc., Tacoma, requires completion of the 105x 180-ft structure in three months, Concrete Engineering Co. fabricated the beams in its Tacoma plant while the contractor was constructing the footings. Then the beams were trucked 10 mi to the site, where two 20-ton cranes were used to handle erection.

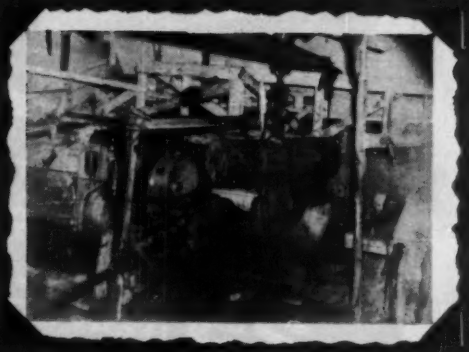
Longyear

Longyear equipment adapted for a difficult job!



Saguenay River storage dam

Horizontal drilling with Longyear heavy duty drill-21" hole



A big core!

Two 21" holes-diamond drilled-38' long

Controlled sluiceway to pumping station downstream

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CANADIAN LONGYEAR LTD., NORTH BAY, ONTARIO · LONGYEAR ET CIE., PARIS, FRANCE

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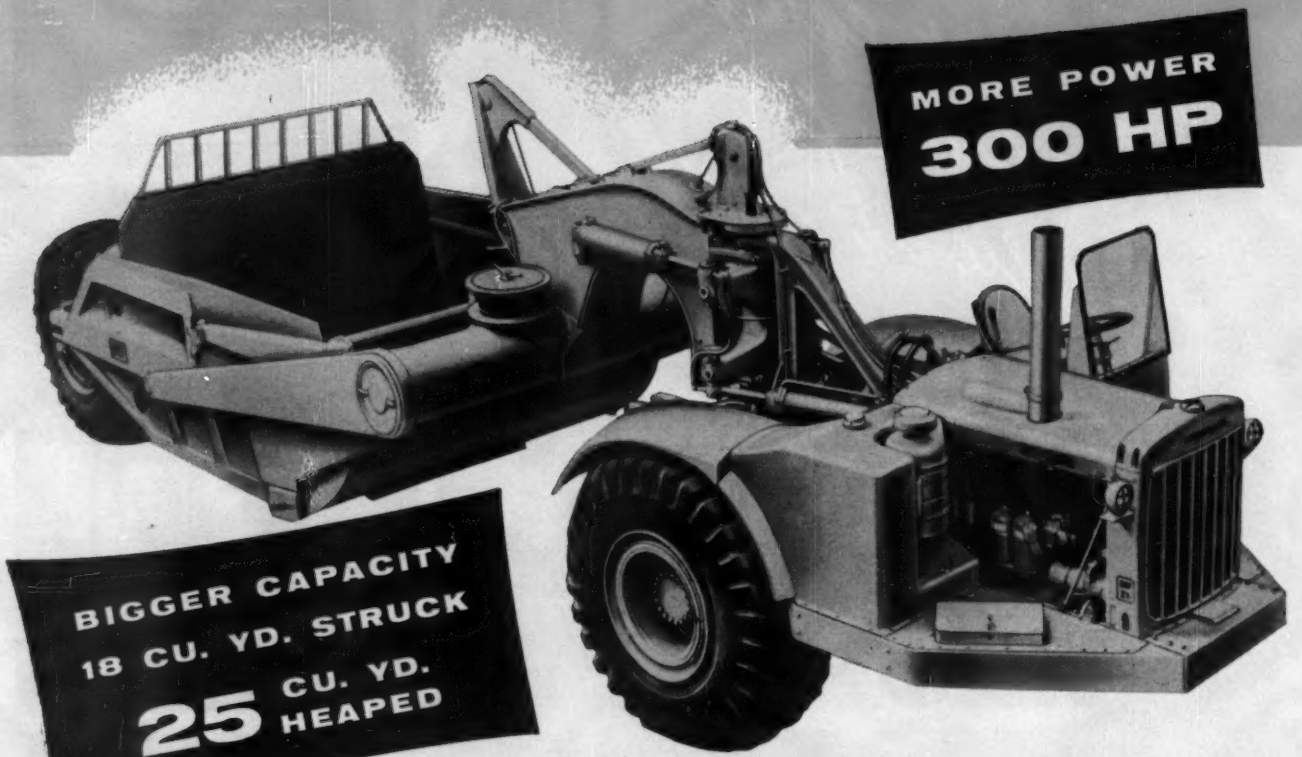

The new two-wheel CAT* DW21 Series C with new No. 470 LOWBOWL Scraper. The new four-wheel DW20 Series E is available with the new No. 456 **LOWBOWL** Scraper, or the new W20 Wagon. Wagon capacity—20 cu. yd. struck.

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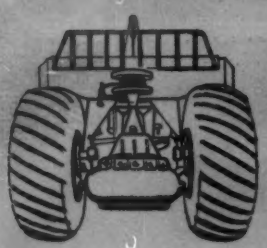
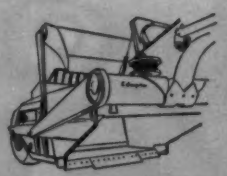
MORE POWER—300 HP at 1800 r.p.m. Ten per cent more rimpull. New 6-cylinder, 5⅛ x 6½ inch Caterpillar Engine. Requires only one operating adjustment. Has hydraulic valve lifters—fan belt tension regulated by convenient capscrew-adjustment of generator.

NEW TURBOCHARGER, driven by engine exhaust, utilizes energy which would otherwise be lost. Packs air into engine according to engine load, not speed. Delivers more working HP—greater performance.

NEW, BIG WIDE-SECTION 29.5-29 TIRES, developed after 3 years of Caterpillar and tire manufacturer research, have proved a success in extensive tests on actual earth-moving jobs. Operating at lower pressures and providing big-footprint flotation and wide-lug traction, they're standard on the new DW20-DW21. Optional—24.00-29 tires.





INCREASED HIGH APRON LIFT provides faster ejection of *any* material.

INCREASED SCRAPER GROUND CLEARANCE enables units to work even under extremely "soft" conditions.

HIGH SPEEDS FOR FAST HAULS:
DW20 (Series E), 2.8 to 32.1 m.p.h.
DW21 (Series C), 2.3 to 20.5 m.p.h.

CHOICE OF STARTING METHODS, optional 24-volt direct electric or gasoline starting engine with 6-volt starting motor.

LARGE AREA PUSHBLOCK gives better pusher contact, faster loading.

AUTOMATIC CABLE SAVER standard equipment.

Plus improved brake control, more easily removed DW20 hitch arrangement, better protected DW21 hydraulic steering system and many other new and thoroughly tested Caterpillar features.

...AND THE NEW LOWBOWL SCRAPERS

Cat DW20 and DW21 Tractors and their matched scrapers have won world-wide acceptance as the standard of money-making performance among earth-moving haulers.

Now Caterpillar offers you two new pace-setting machines in the DW20 Series E and the DW21 Series C and their matched scrapers with exclusive **LOWBOWL** design.

Everything about these high-speed, high-capacity rigs contributes to BIGGER production. The new **LOWBOWL** design of the scrapers utilizes tractor and pusher power at maximum efficiency. The result: bigger loads and faster loading times. Feature after feature, many of them described briefly here, add up to a new profit-making potential for users. Get the full facts from your Caterpillar Dealer.

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NEW DW20-DW21 —GIANT EARTHMOVERS

HOW LOWBOWL DESIGN PAYS OFF IN BIGGER, FASTER PAYLOADS

*New No. 470 Scraper with **LOWBOWL** design*

Both scrapers were loaded with the same material obtained under identical conditions. Result: in the No. 470 a net load weighing 5000 pounds greater than the load in the No. 21—a profitable margin for LOWBOWL design!

Both No. 470 and No. 456 feature this new concept. The bowl has been widened and lengthened, yet bowl depth has been lowered. Horsepower is utilized more efficiently. Material is loaded with less resistance clear out to the end of the loading cycle. Result: faster loading for LOWBOWL design!

Sideboarded No. 21 Scraper

ANOTHER EXAMPLE OF CATERPILLAR LEADERSHIP IN ACTION

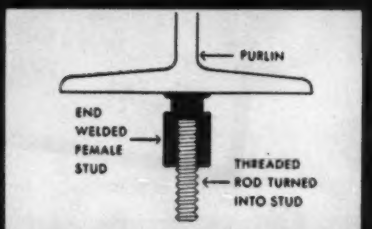
"STUD" NELSON HANGS A

FIXTURE

IN A FLASH!

Watch a contractor go to town with the NELWELD® system, hanging electrical fixtures, securing conduit and cable runs, clamping pipes, and fastening sprinkler heads. You'll see split-second end-welding of female studs, standard threaded studs, shoulder types and eye bolts with the bantam-weight NELWELD gun.

In a flash the stud becomes an integral part of the structure and in minutes the installation is complete.



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Please send more information on hanging electrical apparatus and other cost-saving applications.

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NELSON STUD WELDING DIV. OF GREGORY INDUSTRIES, INC. **LORAIN, OHIO**

brick walls," the complaint charges.

By using the aggregate, the contractor violated a contract provision that the material substituted must be equal to or better than the material listed in the specification, according to the complaint.

Outcome of the suit may hinge on whether the suit has been filed within the time limit specified in the contract.

Zoning Restrictions Lifted For New Medical Building

Vancouver, B. C., has altered zoning regulations to permit construction of a 14-story medical building in an area previously restricted to 6-story commercial buildings.

The $2.7-million project will be constructed by General Medical Building, Ltd., a company formed by a group of doctors. Designed to accommodate 100 owner-tenants, the building will have 10 stories at first plus provision for four more as required.

The building, designed by McCarter, Nairne & Partners, architects, will have an exterior "honeycomb" appearance, with half the wall area to be glass. The ground floor, in addition to a large lobby, will contain a pharmacy, bank, dining room, coffee shop and retail stores. Each of the upper floors will have 10,400 sq ft of space, divided into 378 sq ft bays.

The ground floor will furnish parking space for 46 cars and the first floor roof will handle 100 more. In addition, there will be access to off-street parking.

Alaska City May Start Hydro Project This Year

The City of Seward, Alaska, hopes to begin work this year on its proposed $3.5-million Crescent Lake hydroelectric project.

The Seattle engineering firm of H. T. Harstad & Associates has been retained to prepare plans for the project which would have an initial installation of 2,500 kw and a potential of 10,000 kw.

A $3.5-million bond issue to finance the project already has been approved by the city and negotiations have been completed for sale of the first $500,000 worth of bonds to Grande & Co., of Seattle.

Bid Call for Air Terminal

Port of Portland, Ore., will call for bids for a $3-million air terminal by Jan. 1, according to General Manager John J. Winn, Jr. Seven airlines have completed arrangements to lease space in the new terminal which is scheduled for completion in January 1958.

Smoother, easier driving...mile after mile ...on the Schuylkill Expressway

Schuylkill Expressway, Philadelphia, Pa.

Across America, wherever traffic is heavy and fast, the need is for roads that can *take* it. Roads with joints that stay closed, smooth, free from troublesome, costly maintenance. Many such roads are proving themselves daily . . . through the use of Flexcell Bituminous Fiber Expansion Joint Filler.

Severest traffic and climatic conditions have tested tough, durable Flexcell Expansion Joint Filler . . . shown it to be a big cost-saver in long years on the job. The reason: The extreme resiliency of its rugged cane fiber board core. When concrete expands, Flexcell Expansion Joint Filler compresses without extruding. As concrete contracts, the filler springs back to normal. Joint stays neat, smoothly closed. Laboratory tests prove that even after compression to 50% of original thickness, a "recovery" of over 70% is made.

Flexcell Expansion Joint Filler is low in cost, easy to work with, provides finished joints without trimming. Impregnated with a durable asphaltic compound to resist moisture. Protected against dry rot and termite attack by exclusive Ferox® Process. Will not become sticky or brittle with weather changes. And its rough-textured surface makes a firm bond with concrete. It's ideal for work involving special cutting, tapering, fabricating.

Leading engineers, contractors, architects, many Federal, State, and Municipal agencies have long specified Flexcell Expansion Joint Filler. Investigate the advantages of this widely-preferred filler before you start your next job.

Mail coupon for full data on benefits and economies of Flexcell Bituminous Fiber Expansion Joint Filler for roads, runways, sidewalks, curbs, gutters, driveways, concrete floors and roof decks. No obligation.

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BITUMINOUS FIBER EXPANSION JOINT FILLER

The Celotex Corporation, 120 S. LaSalle Street, Chicago 3, Illinois

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Without obligation, please send me complete data and prices on Flexcell Bituminous Fiber Expansion Joint Filler.

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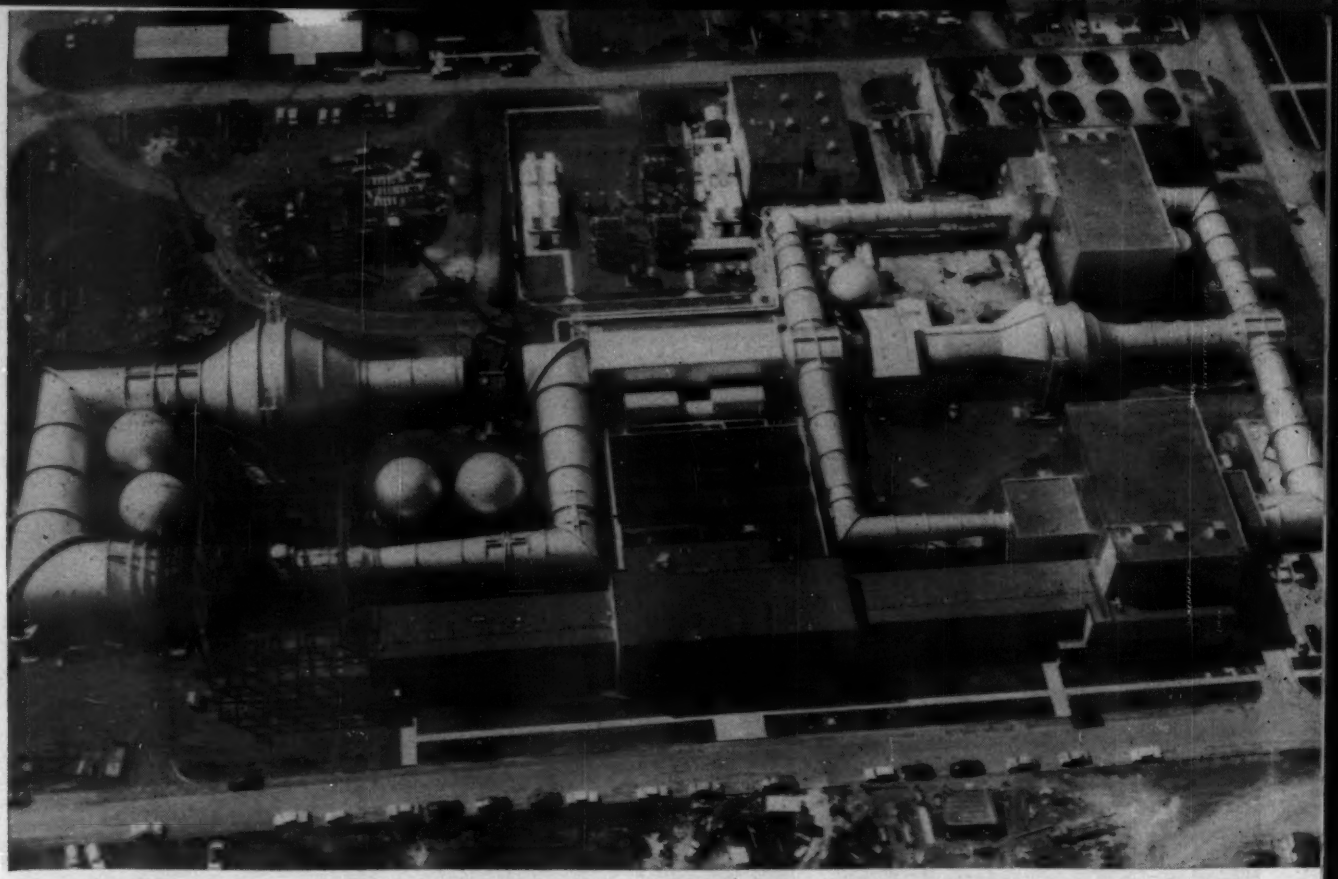


AERODYNAMIC RESEARCH CENTER—Studies in supersonic ranges will be performed in this $27 million facility of the National Advisory Committee for Aeronautics in California. Heavy steel plate work and ticklish foundation problems featured construction.

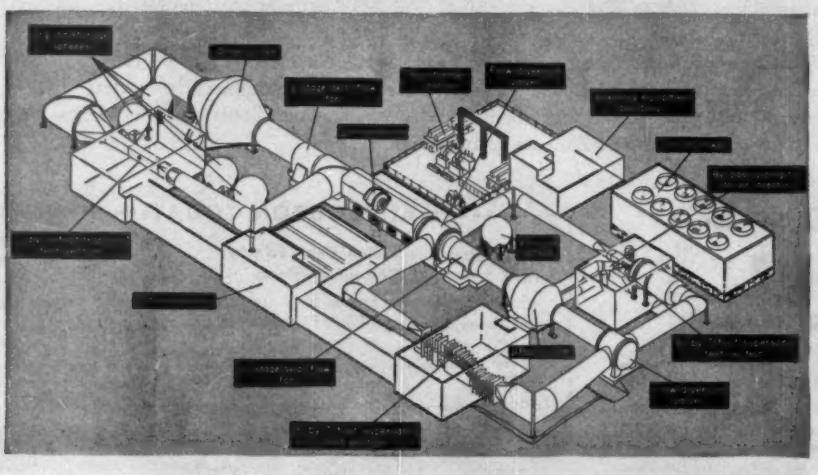
Supersonic Wind Tunnel

A Big Job of Heavy Steel Plate Construction

A $27-million supersonic wind tunnel for aerodynamic research is nearing completion at the Ames Aeronautical Laboratory in California. In the design and building of this research facility for the National Advisory Committee for Aeronautics, these problems were complicating factors:

- Assembly and welding of large, heavy steel plates.
- Foundations on yielding material for minimum differential settlement.
- Control of peculiar thermal expansions.

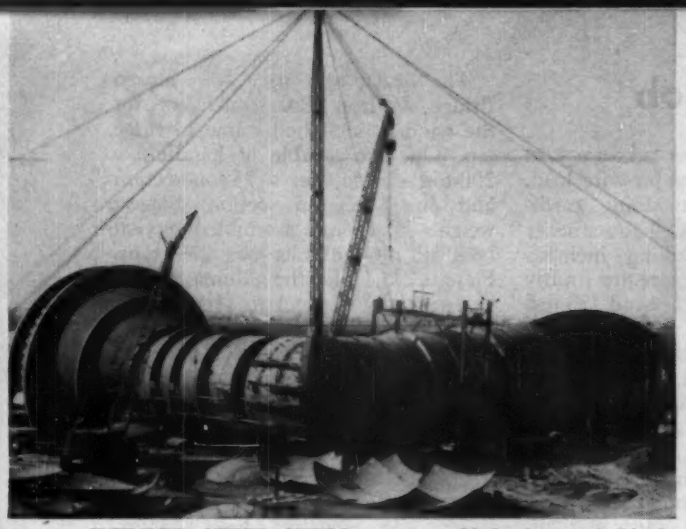
The Ames facility is one of the most powerful wind tunnels ever built—its 216,000-hp motor capacity is comparable to that of the Air Force's Arnold Engineering Development Center near Tullahoma, Tenn. (ENR April 30, 1953, p 30). But the functions of the two test units differ. The Ames installation is intended for research on aerodynamic models with air speeds in the transonic and supersonic ranges—up to 3½ times the speed of sound.



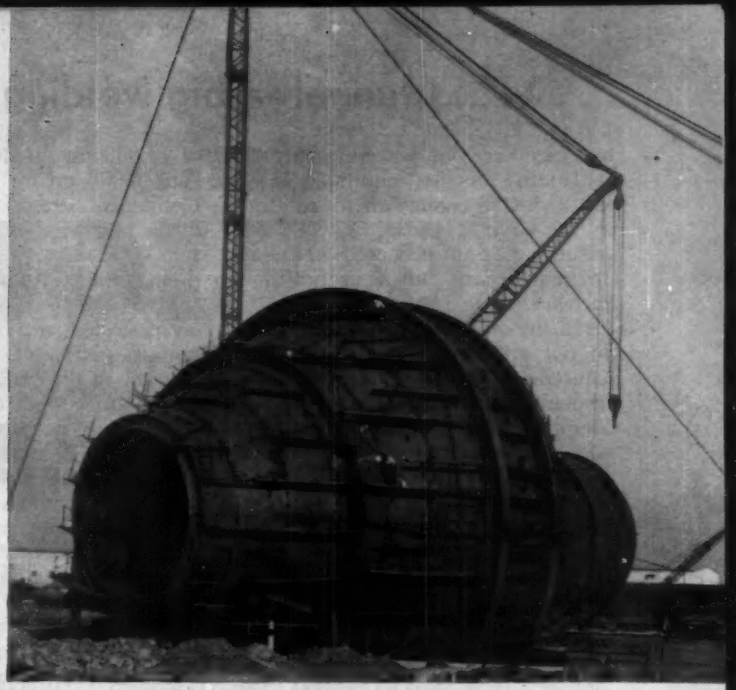
Up to now, the NACA has released meager data on its new facility, following long established policy of not publicizing installations until they are operable (first operation is expected this fall). And, of course, many details of the tunnel are classified because of its relation to national defense.

Aerodynamic research is essentially an empirical science largely based on scale model and full size tests of aircraft and missile shapes. High speeds involved multiply the complexity of the research problems many times. Knowledge of transonic and supersonic speeds is increasingly important to our national defense. To support research in these realms, a program called the Unitary Wind Tunnel Plan has been worked out with the endorsement of Congress. It includes construction of several facilities including the Arnold and Ames installations.

- **Must be large**—Best aerodynamic research results come from full-scale

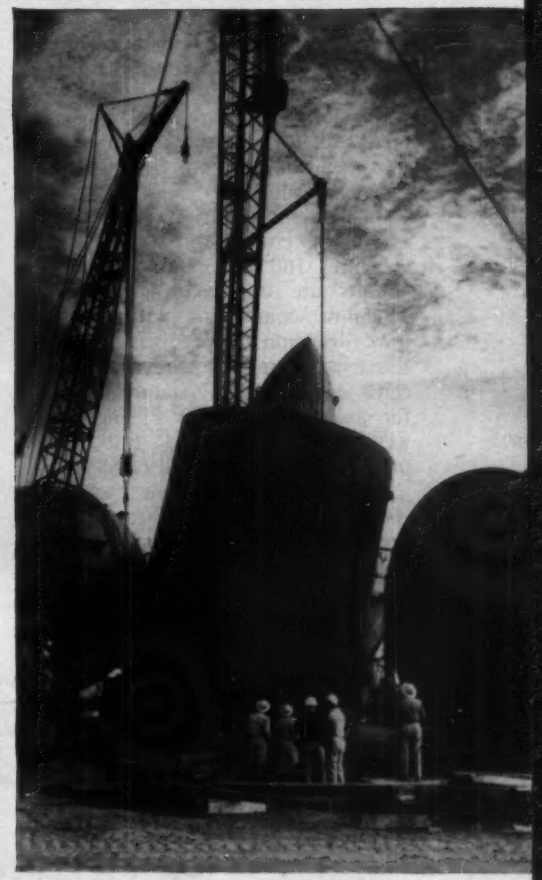


WELDED STEEL SHELL was assembled where possible by rotating cylindrical sections during automatic welding. Gantry straddling tunnel mounts a continuous submerged arc machine.

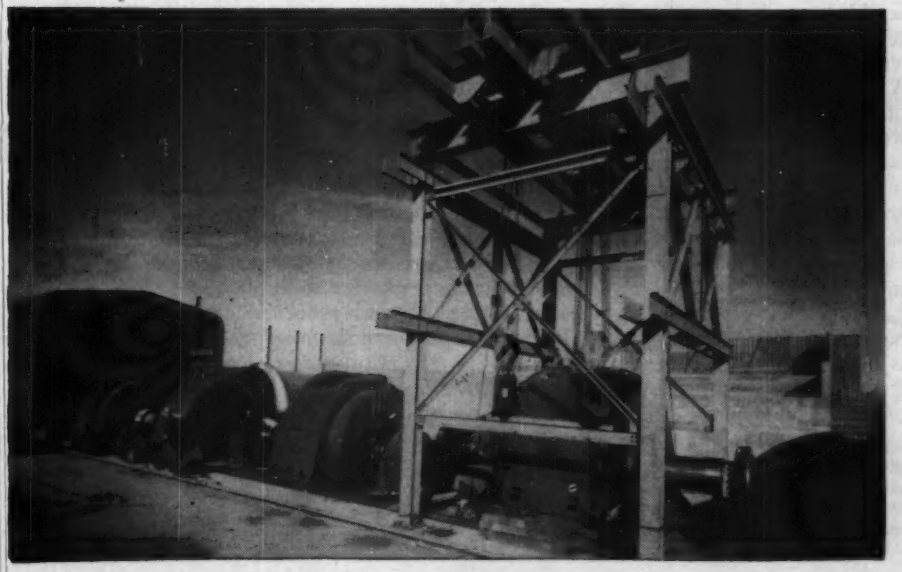


BIGGEST SECTION is this 70-ft dia aftercooler (right). Irregular shape made manual welding necessary. Scaffolds are for welders.

PILES WERE DRIVEN in relatively soft material to predetermined lengths. Primary aim of foundation design for yielding material was to eliminate differential settlement.



HIGH DERRICK installed steel assemblies. 100-ton capacity unit has 100-ft boom.



POWER SOURCE for tunnel operations is four tandem-connected electric motors (left) totaling 180,000 hp normal capacity, 216,000 hp one-hour overload capacity.

. . . Wind tunnel—a big welding job

test facilities, but powering such installations presents enormous problems. Moving enough air for full-scale or large-scale tests requires wind "generators" of unprecedented size. And this requirement puts a practical limit on wind tunnel size.

On the other hand, small-scale tests do not give exact results unless the reduced scale is compensated for by an air density increase. This, too, presents complex problems. The Ames tunnel is a compromise between full-scale and small-scale. It has differing throat sections. The maximum is 11x11 ft for testing in the transonic range. Minimum is 8x7 ft for work in the supersonic range.

The test facility is essentially a three-in-one tunnel. One set of motors will power three separate test loops. Installations can be made in two loops while testing is under way in the third.

Power is supplied by four tandem-drive motors that deliver 180,000 hp continuously or a maximum of 216,000 hp during a one-hour period. These motors power two large compressors—one feeds moving air to one test circuit and the other to two additional test loops.

One circuit is driven by a 3-stage axial flow compressor with a rotor weighing 160 tons. The other two circuits are driven by an 11-stage axial-flow compressor with suitable flow diversion valves being set to select which of the circuits will receive air from the compressor. Rotor assembly for this 11-stage unit weighs some 450 tons. Both compressors have a top speed of 685 rpm.

Beyond each compressor is an aftercooler that removes the heat of compression from the air stream that passes to the test region. Each of the three test facilities is a closed circuit with air continuously being recirculated.

• **Heavy steel work**—The wind tunnel circuits are essentially huge steel conduits that follow rectangular plans. Diameter varies from about 20 ft to 70 ft. And steel thickness ranges from ¼ in. to 4½ in. Most usual range of diameter is about 35 or 40 ft and most of the steel plate ranges from 1 to 2½ in. thick. Both design and construction of the heavy steel tubes is a complex matter.

Steel on the project totals about 15,000 tons with most of it heavy plates. All the steel is welded. Most of it is low carbon steel that has good weld characteristics.

The ASME code for unfired, all-welded pressure vessels is used as a guide in design with a maximum stress of 11,000 psi for direct pressure load and 20,000 psi for non-pressure load. Combined stresses including earthquake and wind exceed basic stresses by 33%. Design loading includes these factors: internal pressure (nearly full vacuum to 15 psi), wind (33 psf on projected area in any direction), seismic (20% of dead load), and thermal (a differential of 85 F).

The huge steel cylinders are reinforced with external stiffening rings. These rings or beams are constructed of heavy plates that include the shell of the tunnel as one flange. Most complicated stiffening ring occurs at a corner where intersection of two cylindrical shapes forms an elliptical section.

• **Welding not easy**—Welding the heavy plates presents two problems: control to insure sound welds and prevention of excessive distortion. Inspection by X-ray, magnaflux and plugging was used to some extent. But the main reliance for production of good welds was placed on skill of the workmen. The NACA required that welders on the job be given special tests in addition to the ordinary welding qualification tests. And, of course, welding work was checked continually by visual inspection.

To test soundness of the work, the shells were subjected to two air tests. The most severe was a vacuum test. And the other test was at 125% of working pressure.

Control to prevent distortion was affected largely through allowance for shrinkage and proper programming to avoid too much welding at one time at one location.

Extensive use was made of manual welding. But where possible automatic welding was employed. In performing the latter, interesting construction techniques were employed. Cylindrical sections of steel plate were assembled on heavy rolls. Two such sections were joined by automatic welding as they were slowly rotated. A welding machine mounted on top of a gantry performed the outside weld in down-hand fashion. A second machine at the bottom of the cylinder welded the inside. Electronic controls synchronized the speed of rotation with the rate at which the electrodes were fed through the welding machines.

Automatic welding of heavy plates has distinct advantages. A bigger bead is used. This reduces shrinkage problems because the area is heated only once. But manual welding was necessary on some of the heavier plate work—such as the 70-ft dia aftercooler—because of the irregular shapes.

The heavy rolls used by Chicago Bridge & Iron Co., contractor for the wind tunnel shell, came in three sets. One set capable of handling a 200-ton section, one a 75-ton section and one a 25-ton section. Biggest weight of any one assembled section handled by the rolls was 239 tons. Plate thickness for the automatic work was generally in the 1 to 1½-in. range.

To handle heavy lifts on the work, Chicago Bridge & Iron installed a 100-ton capacity derrick. It had a 120-ft mast and a 100-ft boom. Maximum capacity was 100 tons. But capacity at full extended boom was 50 tons. Biggest lift in the steel plate fabrication work was 89 tons. The derrick was powered by a hoist that exerted a 25,000-lb pull at 130 fpm.

The derrick was equipped with a sled type mounting that permitted it to be moved without being dismantled. In the course of the work the rig was moved twice—once 65 ft and another time 140 ft.

• **Foundations**—Design of foundations for the wind tunnel was complicated by the 266-ft long shaft connecting the four drive motors and two compressors. Differential settlement of the footing had to be minimized to prevent fouling the motor-compressor assembly. And the supporting material made this a difficult task. The wind tunnel is located near the shore of San Francisco Bay with the underlying strata being a combination of alluvial fill, bay mud. Depth to firm bearing was prohibitively great.

Accordingly the foundations were based on Raymond step-taper piles driven to predetermined lengths. Mounted on the piles was a massive concrete structure situated mostly below grade. The footing included a plenum chamber for air cooling the motors.

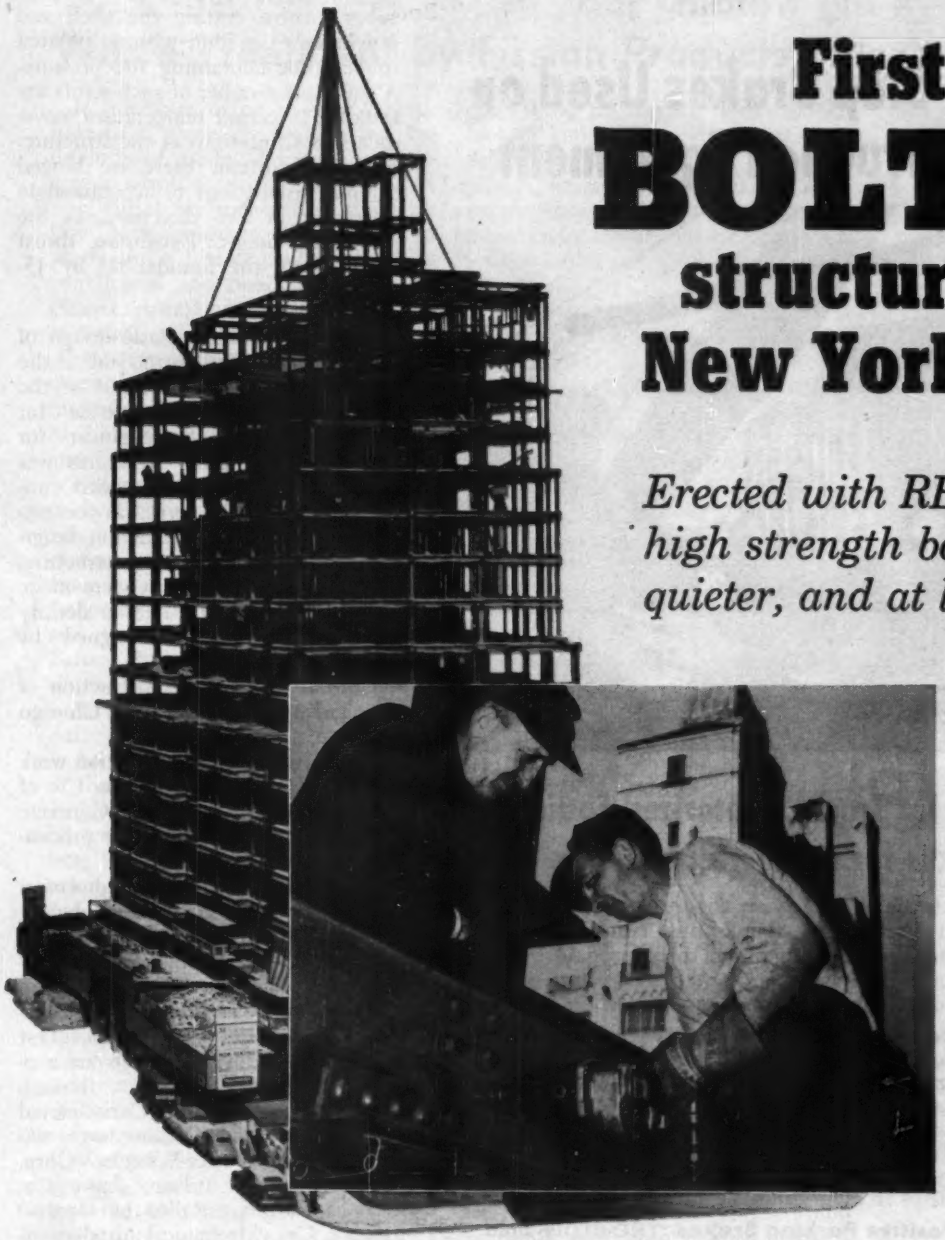
Included in the entire job were some 1,700 piles driven to an average depth of 48 ft. More than 10,000 cu yd of concrete went into the foundation work, largest single pour being 3,240 cu yd. Placing this concrete took 69 hours of continuous pouring.

• **Expansion joint problems**—Circulating air for aerodynamic testing operations results in a large temperature increase. And, of course, this heats the steel structure. In addition there are thermal stresses induced by changes in the atmospheric temperature. Primary difficulty in handling such expansion comes from the fact that the wind tunnel structure must have fixed points at the compressor and at the test section. And additional points of fixity are required for earthquake resistance.

Expansion joints in the huge steel

First BOLTED structure in New York City

Erected with RB&W high strength bolts faster, quieter, and at less cost



35 Park Avenue; Architects, Sylvan Bien — Robert L. Bien; Structural Steel Fabricated and Erected by Grand Iron Works, Inc.; Builder and Owner, Anthony Campagna and Sons.

Two-man bolt team completes more joints per day than the usual four-man rivet crews . . . eliminates hazards of handling hot rivets.

IN NEW YORK, too, the many advantages of construction with bolted steelwork are now being realized. First such structure is this new 18-story apartment building in New York's exclusive Murray Hill district. Field joints are all made with RB&W high strength bolts . . . faster than by riveting, with no ear splitting clatter, and with a big saving in work and costs.

Quickly and uniformly tightened to proper load with impact wrench, RB&W high tensile bolts clamp steel members together with a terrific grip. They develop optimum shear and tension in each joint . . . stay tight under vibration and dynamic loading.

RB&W is the largest independent supplier of high strength bolts for construction. Used from coast to coast, RB&W bolts are noted for their quality, uniformity, ease of assembling and complete dependability for bridges, buildings, and equipment.

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Plants at: Port Chester N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee, New Orleans, Denver, Seattle. **Distributors** from coast to coast.

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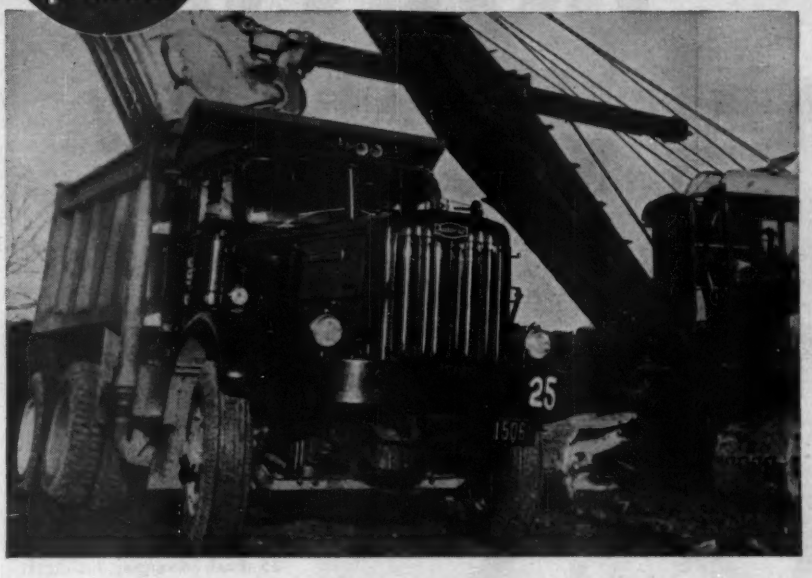
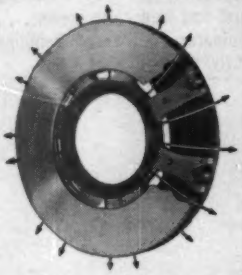


• Emergency Brakes for Trucks, Motorized Equipment
• Cable Drum Brakes for Cranes, Shovels . . .

TRU-STOP disc type brakes have long been the outstanding choice for emergency brakes on heavy duty trucks and tractors. Their outstanding advantages are now causing them to be used to brake cable drums on cranes, shovels and other construction equipment.



Longer Lining Life
• The terrific heat generated in braking cuts lining life. TRU-STOPS quickly dissipate this heat. Most of the disc is exposed to the air even during braking. And a cooling jet of air circulates through the disc, prolongs lining life.

Real Emergency Brakes. On motorized equipment TRU-STOPS *are real emergency brakes—not just parking brakes.* They serve as auxiliary brakes on long down-grades and can bring the vehicle to a quick stop if service brakes suddenly fail. They prevent accidents by insuring quick positive stops in emergency situations.

Positive Parking Brakes. TRU-STOPS hold safely on steep grades—prevent "parking brake" accidents.

Lower Maintenance Requirements. TRU-STOP design simplifies adjustment or relining, decreases maintenance frequency. In truck or bus applications TRU-STOPS are normally mounted on the drive shaft. Relining or adjustment is a simple job for any mechanic with ordinary tools. It is not necessary to drop the drive shaft.

Specify TRU-STOPS for factory installation on your piece of equipment.

You will find a great deal of useful information in the booklet, "TRU-STOP Emergency Brakes." Better send for a copy today.

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tubes involve cutting the shell and providing a slip joint with an inflated rubber tube containing the pressure. A sufficient number of such joints are installed to permit temperature movements in all portions of the structure. And, in addition, there are hinged column installations to accommodate expansion in two directions in the rectangular loops. Expansion thrust is carried to the foundations by 45-deg "columns".

• **Designers, builders**—Basic design of the wind tunnel was by the staff of the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics. Architect-engineer for the primary building structures was John A. Blume, San Francisco consultant. Blume also served as consulting engineer on the foundation design and on the wind tunnel structure. Foundation investigations were made by Dames & Moore. The air density control building was designed by Bechtel Corp.

Contractor for the construction of the wind tunnel structure was Chicago Bridge & Iron Co.

Building work and foundation work was done by Carl N. Swenson Co. of San Jose, Calif. Raymond Concrete Pile Co. served Swenson as subcontractor for pile driving.

Compressors and flow diversion valves were designed and fabricated by the Newport News Shipbuilding & Drydock Co. with installation handled by Eichleay Corp. Electrical drive system was designed and supplied by General Electric Co. Test sections of the wind tunnels are supplied by U.S. Steel Co. through American Bridge and Consolidated Western Divisions. Cooling tower was installed by Foster-Wheeler Corp. Cooling system utilizes Trane Co. heat exchangers installed by Herman Lawson Co. Mechanical installations of air density control equipment is by A. J. Peters & Son.

AEC Creates New Setup For Civilian Participation

The Atomic Energy Commission has established a Division of Civilian Application to implement civilian participation in the development and utilization of atomic energy.

Functions of the new division will include those previously assigned to the Licensing Controls Branch and the Division of Construction and Supply, as well as certain functions of the now-abolished Industrial Liaison Branch of the Division of Reactor Development.

The Division of Civilian Application will be responsible for administering the AEC licensing program.

New use for radiation:

Waste Treatment by Fission Products

Is treatment of domestic sewage or industrial waste by radioactive by-products of production and power reactors possible? Is it probable that economical treatment plants using fission waste products of uranium and plutonium will someday help to satisfy commercial and public demands for cleaner streams and greater supplies of water?

Answers to these and other related questions are being sought with ever-increasing activity in the laboratories of universities, government agencies and private research organizations.

Extensive research is being carried on by the Engineer Research and Development Laboratories of the Corps of Engineers, U. S. Army, in conjunction with the Oak Ridge National Laboratory of Oak Ridge, Tennessee, and it has been demonstrated at Fort Belvoir, Va., that water-borne sewage can be sterilized by gamma radiation without activating or leaving residual radiation in the treated liquids.

According to Harry N. Lowe, Chief of the Engineer Laboratories' Sanitary Engineering branch, the possibility exists that these radioactive waste products can be used to sterilize water, sewage and other liquids.

Other agencies have found that gamma rays can also be used to sterilize certain drugs and antibiotics that are harmfully affected by heat, to preserve meat and other food stuffs through destruction of bacteria that cause spoilage, to irradiate pork, thus inhibiting spread of trichinosis and to decrease bacteria in swimming pools without the use of chlorine.

W. A. Selke, project engineering manager of the Department of Chemistry at Columbia University, New York City, has conducted tests on a specific industrial waste—the highly pollutant pulp waste of the paper industry. In his report of findings, Selke starts with the premise that on one hand there is a potentially enormous quantity of dangerously radioactive fission waste that is difficult to dispose of, and on the other is the highly toxic troublesome waste from the kraft pulping industry. He proposes to "borrow" the radiation of fission waste during the cooling process and neutralize the pulpwaste to mutual solution of both problems.

At present, most pulping wastes are discharged raw into receiving streams, although efforts are being made on the part of many paper industries to install adequate treatment facilities. Activated sludge plants have recently been proven effective in pulp waste treatment. Dilution factors for kraft mill wastes according to Selke, are as high as 200:1 where sulphides, mercaptan and resin acid soaps are in dangerously high concentrations, and even at that factor, fishlife at the point of discharge may be threatened.

Radioactive waste fission products are being stored in deserted areas and dropped into deep portions of the oceans, but ultimate limitations on these methods of disposal have spurred consideration of other methods such as storage in salt domes, underground caverns and even transportation of the material to outer space by means of un-manned rockets. The Atomic Energy Commission has sponsored research in attempts to develop uses for waste fission products by which the radiation from these could be exploited commercially, but indications that even very wide scale use of "hot" materials would not require all the fission products to be produced. However any profitable use might overcome some of the cost of disposal of the remainder.

• **Radiation and pulp wastes**—Selke, who with Ernest J. Henley, also of Columbia University, demonstrated that by giving infinite doses of radiation of the type emitted by nuclear reactor wastes—Columbia labs are equipped with two artificial radiation sources, a one-kilocurie and a 5-kilocurie source of irradiated isotope cobalt 60 from Brookhaven National Laboratory—pulp wastes would decompose into:

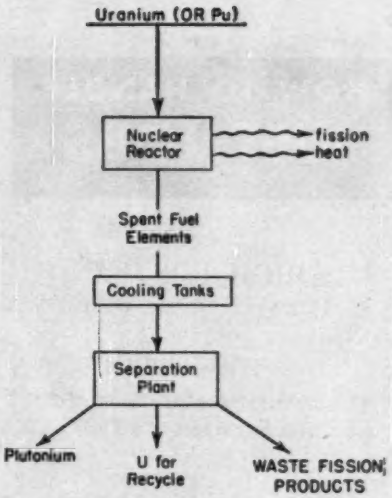
1. Inorganic wastes—All elements would be oxidized to their highest oxidation states.

2. Organic substances—These would be decomposed into gaseous products and charred residue.

Since it is economically untenable to give these materials infinite doses of radiation, one of Selke's aims was to ascertain how closely practical methods can approach the ideal using moderate doses.

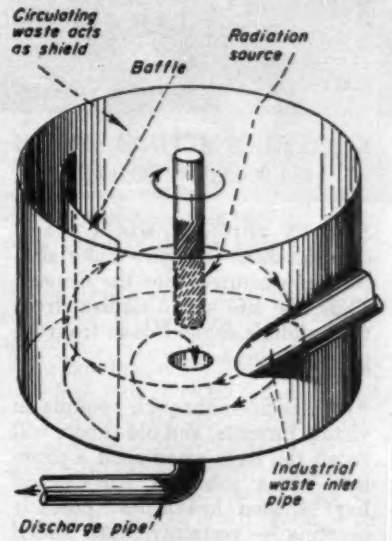
According to Selke, among the many chemical reactions considered for acceleration by means of radiation, the treatment of pulping wastes show more promise than most. The destruction of toxic kraft waste constituents seems worthy of study as does the less clear-cut prospect of hydrolyzing and precipitating some of the constituents of sulfite waste liquor, with consequent BOD reduction.

He cites the following points as making radiation treatment of pulping wastes attractive:



A PROBLEM—What to do with waste fission products

ONE ANSWER—Use them as radiation source to sterilize domestic or industrial waste.



1. One of the major shortcomings limiting the uses of fission products for chemical catalysis is the very high energy of atomic radiation. These energies are as much as a million times higher than conventional bond energies. When atomic radiation interacts with matter, the ultimate net effect is therefore a destruction of the compound. This is undesirable in almost every use except the one suggested—treatment of waste streams.

2. Shielding requirements may be met in part by surrounding the fission product source with the solution being radiated (it was found that six ft of water reduces gamma radiation to about one-millionth of its initial intensity). Although dose rates would be low in peripheral regions, it would seem better to get some use from al-

HOW TO HANDLE
WET JOBS

LEHIGH PORTLAND
CEMENT PLANT

Bunnel, Florida

Contractors: Walsh Construction and Duval Engineering & Cont'g Co.

WELLPOINT METHOD SPEEDS
$11,000,000 PROJECT

SOIL ON THIS JOB was a coarse coquina shell—the very material to be manufactured into the cement. Thus, the site was a natural from the builder's angle. Not so from the pre-drainage angle.

• Water flows through coquina in virtual torrents, and old-timers will recall the days when such a problem—on a job this size—would have spelled headaches: possibly sheeting — certainly much added cost and delay.

• Modern wellpoint methods — so many of them pioneered by Griffin —have changed all that. The system shown in photo dried the job quickly, perfectly and economically, pumping over 7,000,000 gals daily for more than a year. It was not by chance that the Griffin method was selected. Both contractors had used it before—and wanted it again.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

most all the radiation rather than absorbing it in a shield. The flow could be directed by baffles so that the fluids move into the zone of more intense radiation before discharge.

3. As a safety measure, some large nuclear reactors will continue to be built in remote areas. This may place the reactors near lumbering areas and thus reduce shipping charges.

For the pulp industry, isotope sources of radiation as well as processed fission products may be too expensive, and in any case, it will be two years or more before such products may become available. The closest likelihood of commercial feasibility, Selke continues, would seem to involve running the waste streams from a pulp mill through the tanks where reactor fuels are stored prior to processing. This assumes that the pulp mill is close to the reactor. This arrangement would provide enormous radiation doses at relatively little cost.

Possible design for a radiation treatment vessel has been presented by Selke's department. It consists of cylindrical tank with minimum dimensions of 12-ft diam and 12-ft height (this so that a minimum of six feet of waste material would act as a shield for the radiation source located in a holder tube at the center of the vessel). Waste would be led into the vessel tangentially to assure uniform passage through the tank, and baffles would be installed to provide thorough mixing of material and equal radiation to all portions of the waste. Discharge would be accomplished through the center of the tank bottom directly below the source. Where larger tanks are required, several sources could be arranged to provide a zone of nearly uniform radiation flux.

• **More passengers for band wagon**—Early this year two Clevelanders (Ohio) applied for AEC aid in developing a $750,000 research project for investigating the effectiveness of treating sewage, domestic water supply and lake pollution through use of irradiation of these materials by fission waste products. Professor A. J. Teller, head of the Chemical Engineering Department of Fenn College, and George Miller, president of Distillata Co., would—if their request is granted—seek to demonstrate the practicability of destroying non-filterable viruses from sewage before they get into the receiving body; develop cheaper and less cumbersome sewage disposal plants, and devise methods for reducing lake and stream pollution to afford safer swimming and recreational areas.

The Teller-Miller plan calls for use of gamma radiation to destroy contaminating bacteria and viruses by means of fission waste products from the nation's atomic plants. Among the methods they propose to experiment with are encasement of radiation source in glass, and lining sewage transmission lines with clay impregnated with radioactivity.

They propose to erect a pilot plant and prove its effectiveness within a two-year period.

• **Activity on Coast, too**—A private engineering firm has been hired by the San Diego (Calif.) Industrial Development Council to study the feasibility of recovering water and commercial fertilizer from sewage by treating it with gamma rays.

The company, Rudson Engineering Enterprises, Inc., of San Diego, is headed by R. G. Greenbaum, physicist and consulting engineer, and J. B. Kenney, sales and industrial engineer.

The Industrial Development Council, also a private organization, said it would offer the firm's report to the city without charge.

Since atomic waste material has been made available to private industry by President Eisenhower and the AEC, the council is presuming that it could be obtained by municipalities in time.

Water Demands Skyrocket To Plague Arid Southwest

Engineers all over Arizona are looking for new water sources as higher standards of living place critical demands on the state's domestic supplies.

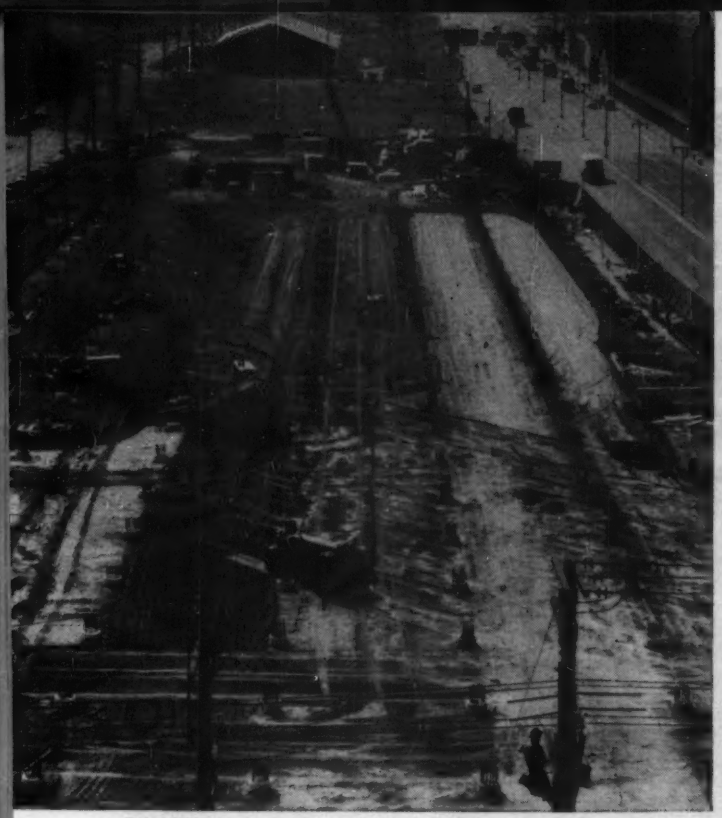
Automatic washers, new and more cooling devices, and increasing residential lawn needs are causing a serious drain on limited water facilities. In addition, meager winter rains have resulted in sub-normal storage.

At Globe, which is located in rocky, mountainous country, water consumption is equaling the combined pumping capacity of all city wells. A serious fire reportedly would empty the reservoir in one hour.

The desert community of Casa Grande faces a critical shortage and is speeding drilling of wells to take care of normal evening water demands. Underground water is available, but wells must go to 800 ft.

Mountain towns in northern Arizona report that springs are drying up from lack of rain. Many ranchers in the Williams-Flagstaff-Ash Fork area are hauling in water for cattle by means of railroad tank cars.

Phoenix, though meeting present demands, is talking about a $10-million program to increase storage and filtration to take care of rapidly-rising population demands.



BACKFILL COMPACTION required heavy rollers to achieve density that is necessary to support the 4,000 psf floor loads.

HEAVY TIMBER SHORING supported second floor slab pours. First floor wall slabs used ground floor slabs as casting surface.

Factory features:

1. Foundations for Heavy Load

2. Precast Wall Panels of Unusual Size

The new 335,000-sq-ft three-story factory building of the American Can Co., in San Francisco is an out-of-the-ordinary structure in several particulars. Its heavy loads dictated the use of two kinds of foundations to meet different soil conditions, and a most thorough backfill compaction operation during construction to permit the ground floor to carry its 4,000 psf design load. Its walls are made up of precast panels, 8 in thick and weighing as much as 30 tons each. And its frame, while largely of reinforced concrete, is topped off by structural steel in the top story and roof.

Ground floor of the structure will be used principally for raw material storage. Upper floors of the factory may be used for machinery installations or storage.

Second floor is designed for 300 psf and third floor for 500 psf. Thus, in addition to 4,000 psf ground floor loading, the underlying foundation must support relatively heavy loads from columns spaced 25x25 ft.

Subsurface investigations indicated a serpentine rock formation fairly near the surface on the northerly end of the site. On the remainder of the area there was a considerable depth of firm clay and loose sandy material overlying the rock. Accordingly, the northerly part of the building is supported on spread footings extending to rock 2 to 8 ft below the floor slab and having an average of 100 sq ft of contact area with the rock. The remainder of the building is supported on concrete-filled, mandrel-driven, steel shell piles driven to refusal. Piles average 20 ft long and have 40-ton capacity.

The building is separated into two distinct structures at the dividing line of the different foundation types. An expansion joint between the building frames is designed to permit up to 3 in. of longitudinal movement without transferring lateral loads from one frame to the other.

To support the heavy ground floor load, quarry rock was imported and

FACTORY BUILDING has clean-cut exterior appearance. Use of precast concrete panels made possible elimination of protruding ledges or other elements.

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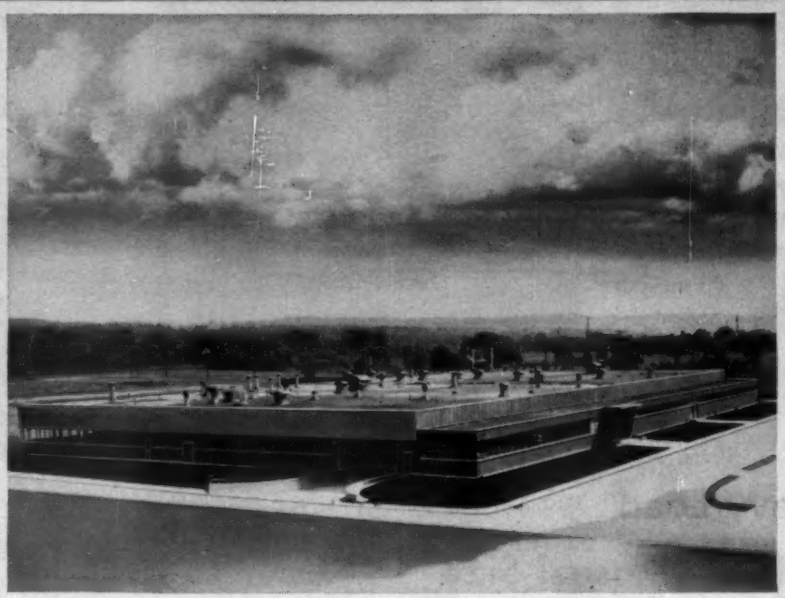

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Wigton-Abbott Corporation, Engineers-Contractors

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backfilled to a depth of 3 ft. The material was to be compacted to 95% of optimum density. Equipment and methods that had produced adequate densities on material of this type elsewhere did not do so here. For this reason, the fill was rolled back and recompacted with multiple passes of water loaded sheepsfoot rollers.

Even with this treatment, in-place densities were found to be below desirable limits. Again the fill was rolled back and replaced in 3-in. layers with each layer being rolled by multiple passes of a 50-ton pneumatic compactor as well as the sheepsfoot rollers. A 6-in. thick layer of crushed rock base course tops the compacted backfill just below the reinforced concrete floor slab.

• **Precast walls**—The 8-in. thick building walls are all precast. Although a 6-in. thickness is generally considered the economical limit of precast walls actual savings resulted in this case.

Main reason for precasting the walls was to achieve speed in erection. The builders considered this to overweigh the disadvantages of very heavy and extremely high lifts. First floor panels were as big as 21x27 ft with panel weight ranging up to 63,000 lb. These panels were cast on the ground floor slab near the point of use.

Second and third floor panels were cast in a nearby yard well in advance of need. Thus, when the second story floor slab had been cast, work could start almost immediately on erection of panels. Weight of these upper floor panels averaged 22,000 lb and lifts were as high as 40 ft.

Flat slab construction, with 10-ft-square drop panels, is used for the second and third floor, thicknesses being 10 and 11 in. respectively. The concrete slabs are covered with a ¾-in. wearing surface. Ceiling height to the bottom of second floor slab is 27 ft.

The 4½-in. thick roof slab is supported by a steel beam and girder frame on steel H-columns. Columns are fireproofed with concrete and beams fireproofed with plaster. With the change from concrete to steel at third floor level, the column spacing was increased to 50 ft. Steel was erected by a 15-ton truck crane that was hoisted to the third floor. The heavy design loading made possible use of this heavy equipment without the addition of any shoring or bracing.

At second floor level, two bridges span 66 ft to connect with an existing facility. Steel through trusses form the bridges.

Building was designed and constructed by J. H. Pomeroy & Co., Inc., contractors and engineers of San Francisco.

For structural diaphragms on warehouses . . .

Plywood Roofs for Economy

M. C. Conkey
Chief Structural Engineer
California Packing Corp.

Nearly half a million square feet of plywood roof diaphragms is being installed in a California Packing Corp. warehouse and factory construction program now nearing completion.

Plywood was selected over other type roofing on the basis of both strength and economy. It is strong enough to resist vertical loads and, through diaphragm action, plywood can help resist lateral forces. Economy has been shown during the program by alternate bidding. And designs have been developed for best use of this roofing material.

Poured gypsum and ribbed steel sheets were rejected for reasons of economy. Such roof decks are excellent in their place but are not economically feasible for a warehouse.

As for wood, the use of 2-in. t&g sheathing laid diagonally was abandoned in 1948 for all CalPack structures. Shrinkage due to the impossibility of obtaining seasoned lumber in volume was so great that the interlocking effect of the tongue and groove was mitigated. This permitted vertical movement of each individual board whenever anyone walked on the roof. Result was damage to built-up roofing; the life of one expensive 5 ply roof was reduced an estimated ½ due to this action.

Painting of the underside of the sheathing was unsatisfactory due to the necessity of treating many large knots with a sealer. The use of plywood has completely eliminated this objectionable feature. The painted ceiling is so greatly improved in appearance that plywood is now being used by CalPack for minor office installations.

Other disadvantages of 2-in. sheathing are: waste due to the end cuts on the diagonal sheathing, necessity for intermediate nailers on long spans, wastage due to rejection of large quantities of poor quality lumber and need to cover knot holes before placing roofing.

Finally, plywood has proven cheaper than t&g wood sheathing. Alternate bids showed a saving in excess of 5¢ per sq ft in favor of plywood.

• **Lateral strength important**—Decision to use plywood for roof diaphragms was spurred by research carried out by the Douglas Fir Plywood Association (ENR Jan. 24, 1952, p. 30). Ability of plywood to resist a portion of the horizontal forces was

JOISTS ARE BOLTED to clip angles fastened to upper flange of supporting steel beam. This assures accurate joist positioning and speeds plywood nailing. Joists can be either lapped or butted.

CLEAT IS SCREWED to plywood to assure diaphragm action in both directions. Cleats can be limited to 12-in. length but can extend full distance between joists if desirable for appearance.

. . . Plywood roofs for economy

an important factor in design of the CalPack warehouse program.

The buildings have large enclosed areas—40,000 to 50,000 sq ft—and a minimum clearance height of 22 ft. This together with heavy wall loads—concrete or brick—adding to the weight of steel beams produces high horizontal shears. The handling of these loads was further complicated by the elimination of all knee braces and any interior vertical bracing.

Solution of this problem can best be described by illustrating with an actual case, a new CalPack warehouse at Emeryville, Calif. This structure is long and narrow (644x120 ft) with one transverse fire wall in the center. This wall resolved the building into two units with a length to depth ratio of 2.68. Main horizontal force comes from the long sides.

In a preliminary study two alternate roof framing systems were considered. The first consisted of continuous parallel chord wood trusses every 20 ft. Carrying trusses down the center lines of the building supported every other truss with center columns spaced at 40 ft. Horizontal forces were to be carried by a horizontal wood truss system to the end walls.

The second alternate proposed the use of rigid frame transverse bents every 40 ft with a longitudinal steel carrying beam down the center of the building. This carrying beam was to support a continuous intermediate roof beam every 40 ft. In other words, the roof joists would be supported every 20 ft either by a continuous bent or a continuous roof beam.

Deflection tests made on full-scale plywood sheathed roof diaphragms by the Douglas Fir Plywood Association and the Oregon Forest Products Laboratory suggested to the writer that an entirely new approach to the solution of this problem could be made. As a result, the lateral forces were distributed between the roof diaphragm and the rigid frame bents in proportion to their respective rigidities. This solution is believed to be unique for overcoming the excessive shears in the diaphragm.

The rigid frame bents consisted of heavily reinforced concrete wall pilasters with a steel column at the center of the building, all with moment connections at top and bottom. As the wall pilasters had to be built, it was inexpensive to convert them into moment carrying members.

A careful analysis of these two alternate framing plans indicated that the steel and concrete construction would be cheaper than the all-wood system. Subsequent firm bids for the steel proved it to be far cheaper than anticipated.

In the Emeryville warehouse the main horizontal force acts in one direction only—at right angles to the joists and parallel to the free edges of the sheets. It was decided to use ½-in. plywood supported by joists at 24-in. centers and omit cleats, bridging.

In another new warehouse in Oakland ⅜ in. plywood, cleated, was used. This building has a length to depth ratio very near unity indicating that an equal horizontal force could come from all directions. The cleats, a development of Berkeley Plywood Co., are needed to provide shear resistance parallel to the free edges of the plywood sheets. The screwed cleats should be a minimum of ⅜ in. thick and 2½ in. wide. Length of cleats can be limited to 12 in. But, if a better appearing ceiling is desired, cleats can extend the full distance between joists.

The use of blocking rather than screwed plywood cleats to close the free edges of the plywood was never seriously considered. Reason is the plywood cleat is dry and won't split or lose its holding power. Thus intermediate blocking between the roof joists was eliminated throughout the entire program. In an average building such an item would be comparatively insignificant. But, when a structure approaches 100,000 sq ft, every structural detail must be carefully scrutinized to determine whether it is absolutely necessary.

To further insure complete continuity of diaphragm action all skylights and other large openings in the roof were completely eliminated as costly luxuries. The largest roof openings were for 30-in. rotary vents.

In connection with selection of thickness, there are some good arguments for ½-in. plywood. In some cases the cleats can be omitted. And the joist spacing can be increased to 30 in. if desired. In addition, the roofing felts can be stapled to ½-in. plywood more satisfactorily than to the ⅜-in. if roofer elected this method.

• **Joists bolted to beams**—In designing the work, a detail was developed that provided positive anchorage of the joists to the steel beams. Clip angles (5x3x¼ in.) were either shop welded or bolted to the steel beams at exactly 4 ft centers. Every other joist was bolted to these clip angles.

Joists can either butt or lap. When they butt they must be carefully trimmed to insure maximum bearing and a proper edge distance for the bolts. When joists lap no trimming is necessary and good bearing is insured. However, a longer stick must be used. And the plywood sheets must be slightly staggered at the joints. After using both details, CalPack engineers have standardized on butt joints.

The clip angles have another great advantage from the practical standpoint. Exact spacing of roof joists insures a perfect fit of the plywood sheets which must meet in the center of the joist to get proper nailing.

• **Specification details**—Prior to writing the specifications for the first units of the program an investigation disclosed that there were many grades, sizes, and thickness of plywood available. But, it was found that only sheets of certain sizes and thickness were obtainable in large quantities. To insure uniformity and a high quality it was deemed advisable to specify panels bearing the Douglas Fir Plywood Association stamp Plyscord C-D and to keep design requirements within the ¼ to ¾ in. available thickness of the product.

Some concern was felt regarding the damage a hard rain would do to exposed Plyscord nailed in place but not yet covered by the roofing. One large roof in the program was caught in the rain and thoroughly soaked several times with no ascertainable damage to the ⅜-in sheets. But, whenever unusual moisture conditions are to be encountered such as outside canopies or ceilings exposed to steam, the exterior-type, waterproof-glue plywood should be specified.

For maximum strength it is essential that the panels be laid with the face-grain perpendicular to the supporting joists. As this feature could be overlooked in the rush to complete a roof it should be called for in the specifications and shown on the sheeting and nailing diagram.

Nailing schedule for ends of panels bearing on framing members should be computed in accordance with values covered in the Uniform Building Code of PCBOC. Nail size should also be covered.

The writer is convinced that the best sheathing installation can be obtained by sub-contracting the work to plywood specialists and this was suggested in the specifications.

This building program is being carried out under supervision of H. A. Calkins, chief engineer, California Packing Corporation. The author, formerly with CalPack, is now senior design engineer with the San Francisco office of the H. K. Ferguson Co.

Valuable service was rendered, both in preparing the specifications and in giving practical advice, by Henry Bacon of the Berkeley Plywood Co., Oakland, Calif.

Architect: Weed Russell Johnson Associates, Miami
Contractor: Edward M. Fleming Construction Co., Inc., Miami

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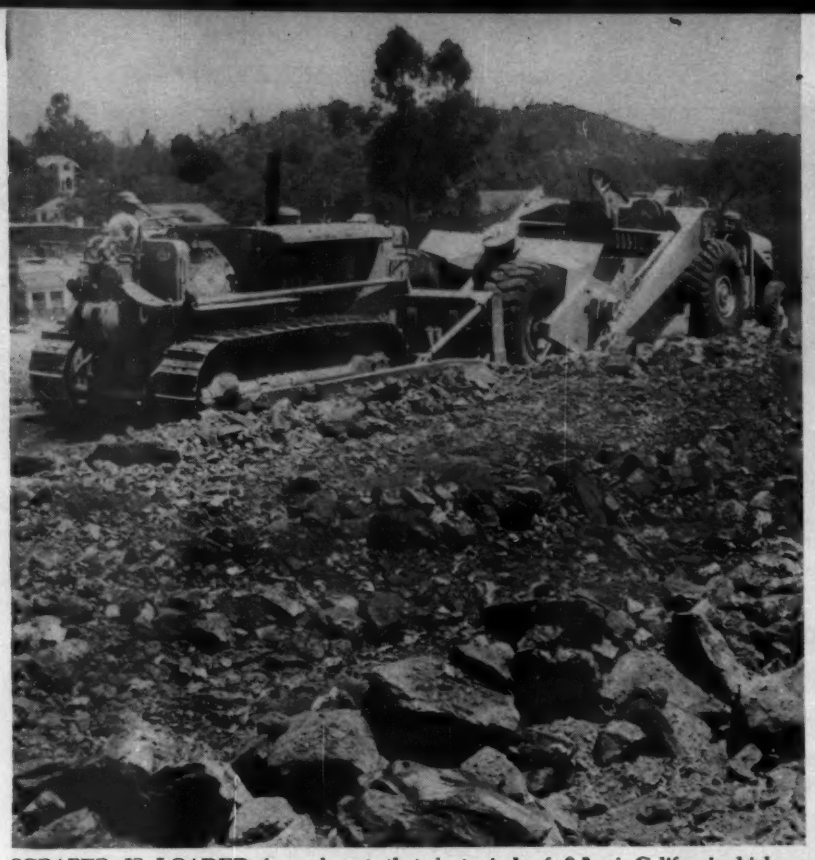


SCRAPER IS LOADED in rock cut that is typical of 9.3-mi California highway job. Excavation totaling 1,702,000 cu yd is being handled entirely by scrapers.

Scrapers Handle 9-mi of Rock

On a job where most contractors would make extensive use of shovel and truck operations, Madonna Construction Co. of San Luis Obispo, Calif., is moving entirely by scraper 1,702,000 cu yd of highway excavation—most of it compacted shale. This rather daring construction feat is being carried out on a 9.3-mi stretch of U. S. 101, halfway between San Francisco and Los Angeles.

Completing the $3-million contract in 270 days, as is required, would be a relatively easy task if only grading were involved. But the work also includes structures and paving. And some of the excavation goes into super fills that have a 5-ft surcharge to be left in place two to five months to settle foundation soils.

The work is part of the California Division of Highways' program of converting the major north-south coastal route to freeway standards. It will provide a four-lane divided highway that bypasses the towns of Atascadero and Santa Margarita. The existing highway—two miles longer—is only two lanes wide and is the main street of these two towns. The new highway will have four 12-ft lanes and a 36-ft median strip. It will have limited access but will not be a complete freeway in that there are two crossings at grade for little used side roads. There are, however, four grade separations plus pedestrian undercrossings and farm service undercrossings. Construction is due to be completed April 5, 1956.

In the bidding early this year, Madonna Construction Co.'s tender of $2,965,000 was $270,000 below the next bidder. It is likely that much of the reason for the low bid was Madonna's determination to make extensive use of carrying scrapers. For the 1,702,000 cu yd of roadway excavation Madonna's bid was 27¢ per cu yd. Another significant excavation bid figure was the $0.003 per station yard for the 18,700,000 station yards of overhaul. (Biggest bid item, however, was 56,300 cu yd of pavement concrete bid at $13.50).

• **Grading by scrapers**—Madonna Construction Co. has on the job almost two dozen Wooldridge carrying scrapers varying in capacity from 17 to 26 cu yd. The scrapers do all the excavation work, even in the hard shale that predominates. The operation is extremely rough on the equipment—but down-time does not seem to be too great. Most of the cuts have to be prepared for scraper operations by extensive ripping.

The contractor puts more value on operator time than on equipment rental cost. Extra carrying scrapers are kept in a standby capacity. Thus, when a scraper is down for servicing or repair, the operator can be switched to the standby unit. Actually the standbys are older equipment owned by the contractor that probably would lie idle anyway.

Scraper operations are generally split into three spreads. From four to twelve units operate in each spread depending upon the yardage to be moved, length of haul, and available working room. A single push-cat can handle loading in a four-scraper spread. Where there are more scrapers, two push-cats are needed.

All of the spreads are carefully balanced. That is, there is just the right number of push-cats and rippers servicing the cut and the right number of tractors, graders, rollers and sprinkling trucks servicing the fill to keep the work running smoothly.

Each cut is carefully evaluated for best scraper loading. In some material, the scrapers can be fully loaded where the surface is flat. Other materials require steeper loading conditions.

All the excavation goes into fills. But not all the fills are routine. As was mentioned earlier, there are several settlement fills where a surcharge of 4 to 5 ft is placed above final grade to settle the underlying soil. There is a total of 36 stations of settlement fills, the longest single one of which is 13 stations long. As would be expected, the specifications required the settlement fills to be first-order work. They are to be left in place from two to five months, thus the necessity for placing them early.

On another fill the subsoil is a very light-weight diatomaceous shale. This material runs only 68 pcf and expands when wet. In this case a 2-ft thickness of the subgrade was removed and wasted. This was replaced by imported subgrade. Purpose is to keep

RIPPER PREPARES CUT for scraper operation. One key to success of scraper operations is thorough breakup of hard shale.

SOME CUTS ARE HIGH but all excavation has been handled by scrapers hauled by rubber-tired tractors.

FILL IS PROCESSED by sprinkler truck and grader as scraper speeds over carefully tended haul roads. Properly equipped fill operations result in better compaction and quicker scraper turnaround.

BULLDOZER SPREADS FILL left by two scrapers as another approaches with load. Slotted, steel-wheeled roller compacts fill.

the subsoil dry to prevent swelling that might warp the concrete paving.

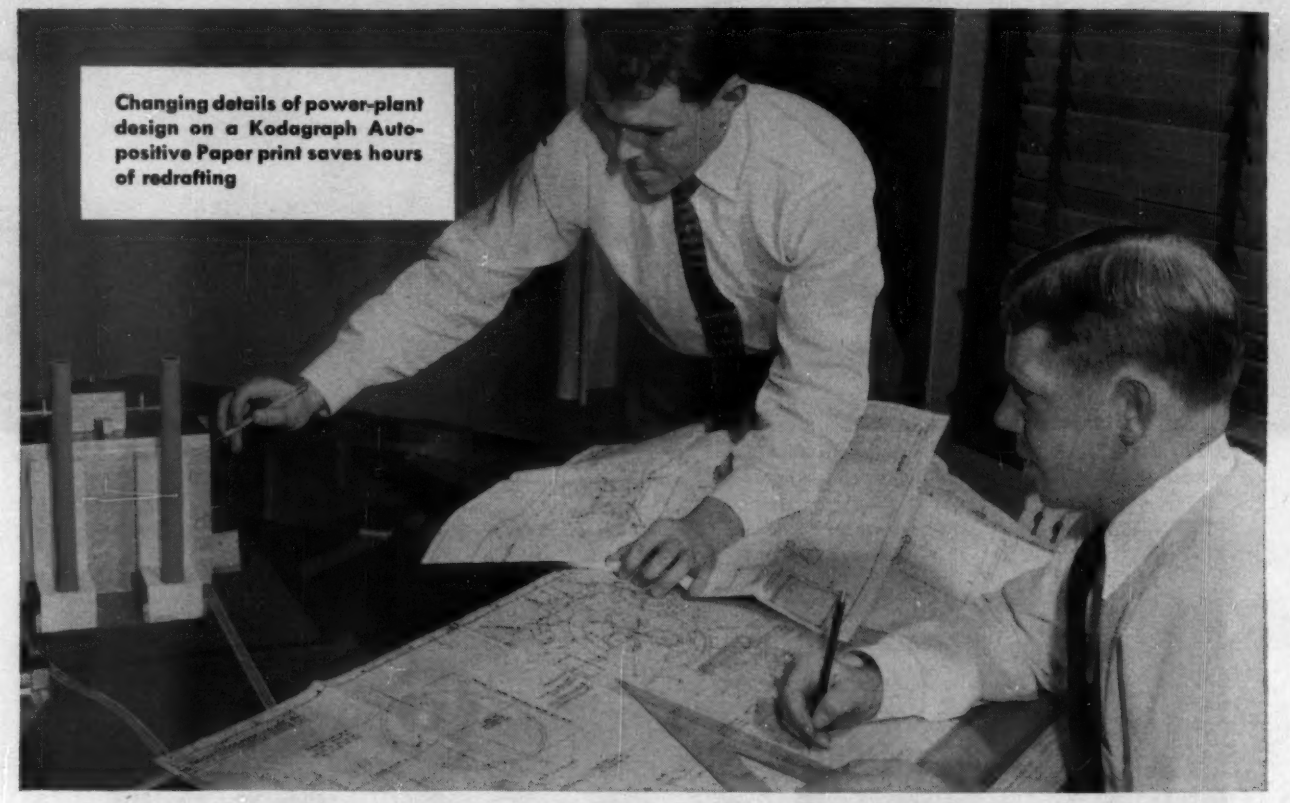
• **Tight time schedule**—the 270-working day time limit on the job means that contractor operations have to be maintained at a high level. In the first four months on this job, the contractor moved a million cubic yards of material. Best month was close to 400,000 cu yd. Maximum working day was 23,000 cu yd. That was on one shift operation.

Fill work must proceed swiftly to permit time for paving. The structural work—four grade separations and two stream crossings—will be done during the entire working period.

Reason for the tight time schedule is that the California Division of Highways wants to provide highway users with an improved facility at the earliest possible date. That's also why in this instance grading, paving and structures are lumped in one contract. A secondary reason for the short-term, large-sized contract is that it conserves on the critical supply of engineering personnel. The staff of inspection personnel will be freed sooner to take on other work. And, by lumping it into one big job fewer inspection personnel are required.

The Atascadero-Santa Margarita Freeway is a project of the California Division of Highways, G. T. McCoy, state highway engineer. The work is planned and supervised by the staff of District V, E. J. L. Peterson, district engineer. Resident engineer is G. D. Gardner.

Supervising the work for Madonna Construction Co. is Alex Madonna, project engineer, with R. W. Osborn acting as general superintendent.



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Toledo Edison Company reports on its use of Autopositive—

"One saving after another since 1947"

Shortly after Kodagraph Autopositive Paper was introduced, the Toledo Edison Company, Toledo, Ohio, began exploring its possibilities for engineering drawing reproduction.

Here was a revolutionary photographic intermediate paper which produced positives directly from positives—no negative step. It could be exposed in standard print-making equipment . . . processed in standard photographic solutions. *Entire operation in ordinary room light, too.* Jobs which had been difficult and costly became easy and economical—Kodagraph Autopositive Paper costs only a few cents a square foot. Some typical savings at Toledo Edison *which you can duplicate* are listed here.

☐ **Old prints and intermediates reclaimed.** No time lost retracing. Autopositive Paper strengthens weak line detail, cleans up backgrounds. Toledo Edison now can get intermediates which have dense photographic black lines on an evenly translucent paper base. *Original quality or better!*

☐ **Opaque originals no problem.** Many of Toledo Edison's forms, charts, operating maps, etc., are on opaque stock—some two-sided. Data is added to these in pencil or by typewriter. Then Autopositive reproductions are made and used to produce the direct-process prints needed for distribution. The 1954 Annual Budget, for example, was reproduced in this manner. *Autopositive saves time and dollars for all departments.*

☐ **Print-making simplified.** Toledo Edison runs Autopositive intermediates at uniform, practical speeds in its direct-process machine . . . gets sharp prints time after time. *Autopositive lines do not smear, smudge, or lose density.*

☐ **Drafting shortcuts.** An Autopositive print is made of a drawing which has to be altered. The obsolete detail is eradicated or scissored out, and another Autopositive is made. New design is then added, and the job is completed without redrafting.

☐ **Photo-lasting file copies.** Toledo Edison also finds that Autopositive intermediates will not turn yellow or become brittle . . . are ready to produce sharp, legible prints whenever needed.

Kodagraph Autopositive Paper

"THE BIG NEW PLUS" in engineering drawing reproduction

Shows all the ways you can save with Kodagraph Autopositive Paper.

MAIL COUPON FOR FREE BOOKLET

67

EASTMAN KODAK COMPANY
Industrial Photographic Division, Rochester 4, N. Y.
Gentlemen: Please send me a copy of "Modern Drawing and Document Reproduction."

Name _____ Position _____

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Kodak
TRADE MARK

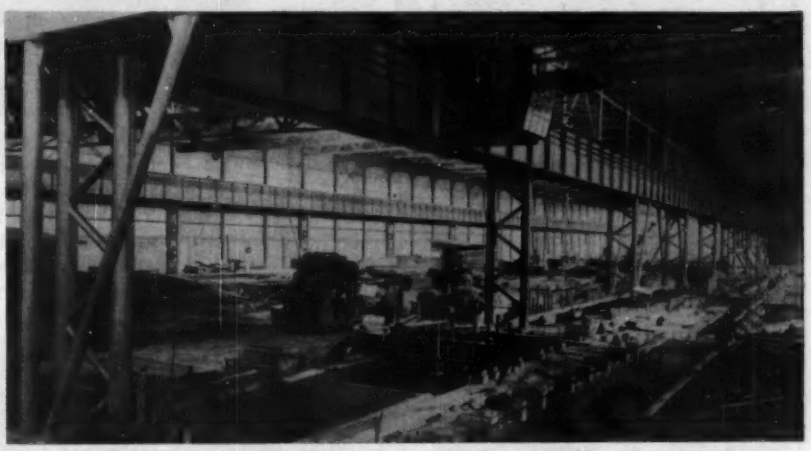
Steel Pipe Factory Is Built of Pipe

The first interesting fact about a new plant for manufacturing resistance-welded steel pipe, which was dedicated two weeks ago at Port Moody, near Vancouver, Canada, is that it is German—in financing, ownership, machinery and even building framing. And its second noteworthy feature is that the main structural elements—principal columns, roof trusses and bracing—are all fabricated from steel pipe using welded construction.

Canadian Western Pipe Mills, Ltd., is the name of the owner of this first German import into far western Canada, and it is a subsidiary of the pipe manufacturing firm of Phoenix-Rheinrohr of Mulheim-Ruhr, West Germany. The purpose of the new facility is to furnish both black and galvanized pipe in diameters from ½ to 4½ in. to the expanding construction and industrial market of western Canada. The cost of this 60,000-ton capacity plant was $6 million, and it was announced at the dedication ceremonies that an additional investment of about the same magnitude is being planned to enlarge the plant to enable it to manufacture other sizes of pipe up to 16 in. diam.

The 136,000 sq ft plant contains four bays. The main manufacturing bay is 107 ft wide and 700 ft long, and beside it is a pickling and galvanizing bay 72 ft wide and 450 ft long. At right angels to these bays at one end are two more bays 72 and 40 ft wide and 251 ft long, one for material preparation and storage and the other for offices. All of these bays are spanned by welded pipe trusses, fabricated in the parent company's plant in Germany and shipped to the job in 35 and 40 ft lengths. Each bay is also equipped with a crane runway so that the crane girders carry the columns that support the roof trusses and in turn are carried on columns that double as the main building columns. These later columns are in the form of braced pipe bents, also prefabricated in Germany.

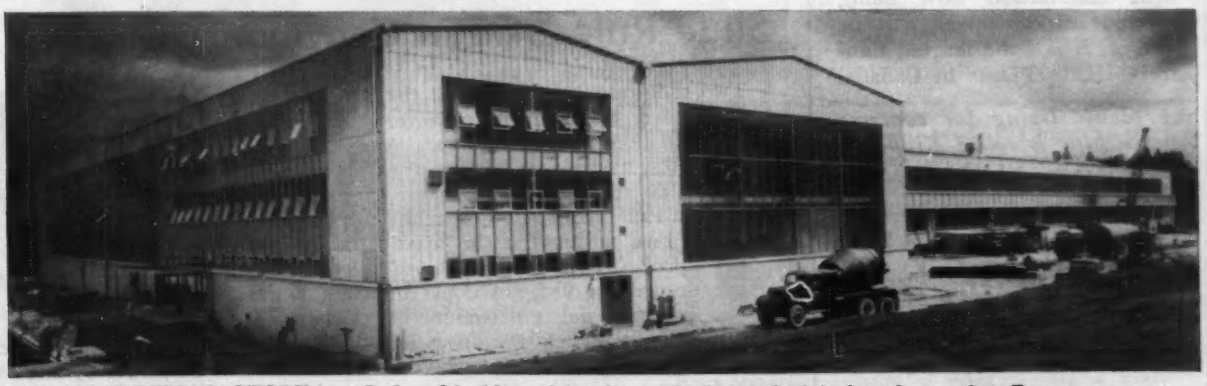
WELDED PIPE TRUSSES, prefabricated in Germany, span bays of pipe factory.



MAIN COLUMNS ARE BRACED PIPE bents fabricated by welding. They support the crane girders and in some cases the outside walls as well.

Building enclosure consists of an 8-ft-high base course of 4 in. thick precast concrete panels and above that wire glass sash and cement-asbestos sheet. Because the soil is loose silt and gravel over a dense glacial till, spread footing foundations could be used only for the lighter loads or where some settlement could be countenanced, concrete piles were used—of the displacement caisson type, of 8, 10 and 22 in. diameters with the latter designed for loads of 110 tons.

Consulting engineer on the job was B. D. Bohna, J. L. Miller & Co. of Vancouver while the owner acted as his own general contractor using some sixteen Canadian firms as sub contractors.



THE COMPLETED FACTORY is an L shaped building of four bays. The bay at the left above houses the offices.

COMMENT
from the
BUTLER ENGINEER

—of potash—quicksand and planes

A quick trip to northern Canada. They're working an enormous potash deposit there, 3000 feet underground. How did they find it? Simple. They were drilling for oil.

They've dug a hole to the potash that is 16 feet in diameter. Really a difficult job, for first they had to blast and drill to a great depth. Then they hit many feet of quicksand. To get through this they froze it. That's what I said — froze it! Brought in huge refrigerating equipment. How's *your* Deepfreeze working? Try some of our frozen quicksand. Delicious on strawberries.

Now they're lining that huge vertical tunnel to Hell with concrete. That of course was why I was there. And it's a project in itself. Naturally it's a Butler Plant they will be using.

Your Butler Engineer is the reason the airlines are paying dividends. In talking with a pilot, I gave him my total passenger hours in the past month. He figured a moment and then said "That's considerable more time in the air than our DC-3 pilots put in!"

It's not all unmitigated pleasuse. In a recent 3-day period I was "stacked up" over airports for a total of 11½ hours. Weather, of course.

Notes made in flight: A BUTLER installation now being erected in Vancouver will be one of, if not the largest, Central Mixing Plants in Canada.

A plastic lining for concrete sewer pipe is called Krapcote. Appropriate, what?

Best regards,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

NEW PRODUCTS

Paving Vibrator Mounts on Spreader

A new high-cycle full slab paving vibrator attachment is designed for mounting on any concrete spreader or finisher for use in the construction of airport runways, aprons and highway pavements.

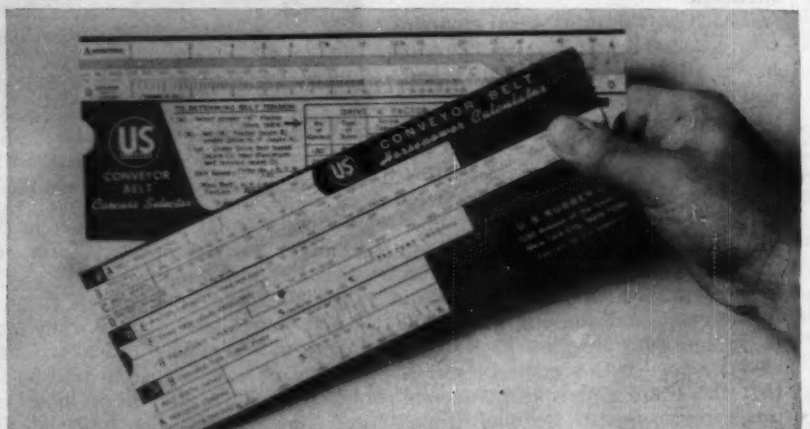
Said to be capable of vibrating full slabs as much as 25 ft wide to depths of 19 in. with Model HFSV-3 vibrators and thinner slabs with Model HPV-3 vibrators, the attachment mounts directly on the spreader or finisher. It consists of a lightweight, durable, sectional steel frame on which up to 10 spring-suspended concrete vibrators are mounted. No auxiliary carriage is required.

The frame and vibrators are raised, lowered and positioned by double-acting hydraulic cylinders mounted on adjustable brackets. A four-way, three-position valve connected to the spreader or finisher's hydraulic system controls the cylinders. Vibrators are turned on and off by a switch located within reach of the spreader operator.

Model HFSV-3 and HPV-3 vibrators operate on 180 cycle, 120 v, 3 phase current. Similar in design and construction to standard high-cycle vibrators, they are spring mounted on brackets which permit adjustment of vibrator angle and depth. Model HFSV-3 is mounted for near-vertical immersion in the concrete. Model HPV-3 is mounted for horizontal immersion. Both operate with heads completely submerged. The vibrators produce low amplitude vibrations, with frequencies from 5,000 to 10,000 vpm obtainable by regulating generator speed. According to the manufacturer, they will handle the stiff concrete mixes commonly specified for airport and highway pavements.

Power to operate ten vibrators is supplied by an 18.7 kva generator with built-in exciter and voltage regulator of the magnetic amplifier type. Initial excitation is furnished by a 6-v battery. The generator is driven by a 4 cylin-

(*Continued on page 52*)



Slide Rules Aid in Conveyor Design

Two slide rules are said to cut the time needed to design a conveyor belt installation from three hours to ten minutes.

The slide rules are a horsepower calculator and carcass, or belt fabric selector. Five settings on the horsepower calculator will give the horsepower needed for 98% of conveyor belting systems, and a maximum of seven settings will yield the drives for level, incline or decline, manually operated tripper and self-tripper systems.

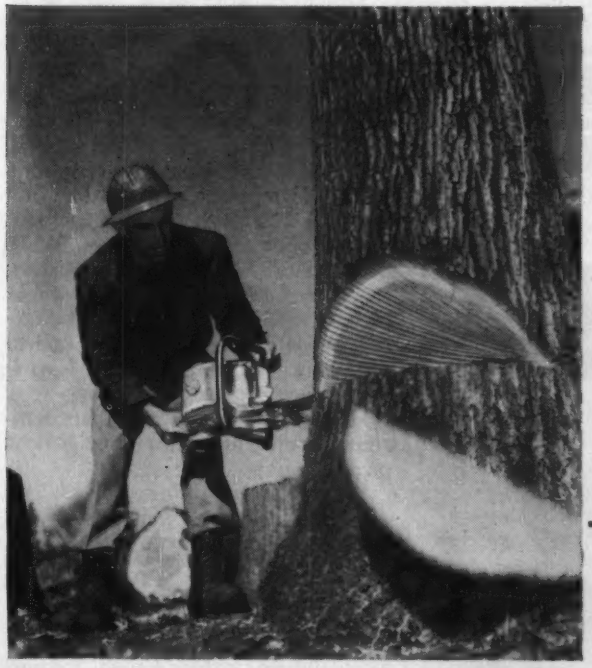
The carcass selector will pick the right belt fabric for any conveyor belting system, as well as the maximum and minimum number of plies for proper troughing, and minimum pulley diameters for the entire system—take-up, drive, tripper and idler pulleys. This rule will select the correct belt fabrics, once the horsepower is known, in only two settings.

The rules are available on request. U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.

Now! Do All Three Clearing Jobs with One HOMELITE Chain Saw

New Versatile Attachments for Model 17 Chain Saw Will Clear Everything from Brush and Brambles to Four-Foot Trees. Save Money on Equipment and Job Time by Following These Three Steps:

1 Clean Out Underbrush — Attach the new Homelite Brush Cutter to your Model 17 Chain Saw . . . in minutes. Perfect balance makes it a cinch to operate. Clears dense undergrowth, brush and small saplings four times faster than hand-clearing methods. Friction-free flexible shaft delivers full 3.5 horsepower to 10-inch circular saw.



2 Clear Small Trees and Saplings — In a jiffy the new Homelite Clearing Attachment converts your Homelite Model 17 Chain Saw to a fast-cutting, light-weight clearing tool. Plunge cuts or plunge bucks and makes limbing an easy job. Open guide rail prevents pinching and binding . . . takes the backache out of knocking the small ones down and cutting them up for haulage.

3 Now For The Big Stuff — With the standard guide bar you can bring down trees over four feet in diameter. The Homelite Model 17 is light in weight, easy to handle and packed with more horsepower per pound than any other one-man chain saw ever developed. (3.5 hp — 22 lbs.)

With its new attachments the Homelite Model 17 Chain Saw will give you the versatile, fast-cutting, dependable performance you need to save time and make real profits from clearing. Ask your Homelite Representative for a free demonstration or write for information.

PERFORMANCE · DEPENDABILITY · SERVICE

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CORPORATION

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Carryable Pumps • Generators • Blowers • Chain Saws

BIG HEAD START
ON DEADLINE WITH
FOSTER
RENTAL
STEEL—SHEET
PILING

Checking Foundations with 120-Ton Load on H-Bearing Frames Anchored to Foster Piling
Hotel - Department Store - Parking Facility
THE DENVER COLORADO PROJECT

Contractors Webb & Knapp got a *Head Start* on this gigantic project by calling Foster for rental steel-sheet Piling, to complete four sumps (that were holding up the major excavation of this 400-foot square foundation). Foster delivered *on time*, the exact sections and exact lengths of steel-sheet Piling needed to get a head start on work schedules.

Foster 12"x 53 lb. H-Bearing Piles driven an average depth of 50 feet, around perimeter of the gigantic 400 foot excavation.

Whatever You Need in Piling
Call L. B. FOSTER for Service
• STEEL-SHEET PILING • H-BEARING PILES
• LIGHTWEIGHT PILING
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FASTER from FOSTER
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der, liquid-cooled engine at 1,800 rpm.

The engine and generator are skid mounted for installation on any spreader or finisher, and the manufacturer also offers other sizes of generators for applications where fewer vibrators are required. Individual receptacles for vibrator cables are enclosed in a sectional box conduit mounted on the spreader or finisher.

The attachment is furnished as a complete package consisting of frame, brackets, vibrators, hydraulic cylinders, valve and piping, conduits, control switch, cables, engine-generator, plus necessary mounting hardware. Detailed installation instructions and mounting drawings are also supplied. Maginniss Power Tool Co., 134 Spruce St., Mansfield, Ohio.

Device Converts Hand Drill To Handy Drill Sharpener

According to the manufacturer, anyone can sharpen a drill to the right point angle with Sav-a-dril, a new sharpener complete with grinding wheel.

Using the power from any electric hand drill, the sharpener will handle any size drill bit from $\frac{1}{8}$ to $\frac{1}{4}$ in. Its 20-in. diameter fine grit grinding wheel is mounted on a $\frac{1}{4}$-in. shaft. An extension of the shaft fits the chuck of any electric hand drill.

The Sav-a-dril can be used wherever the drill is used. It may be held in a vise, screwed to a bench or board, or merely placed on a flat surface for operation. There are no adjustments to make as the drill holder is preset at 59 deg, the angle generally accepted for most drilling uses.

To sharpen a drill, the user simply clamps the attachment in the electric drill's chuck. The dull drill bit is placed in the holder; one of its cutting edges is aligned with the center of the grinding wheel, and the electric drill is started. Guided by the holder, the drill is pivoted once or twice with an easy, natural motion to produce a properly contoured point. A gage for checking the angle and centering the re-sharpened point is part of the unit.

Sav-a-dril is priced at $2.95, complete. Popular Mfg. Co., 4115 Glencrest Rd., Minneapolis 5, Minn.

SHARPENER includes grinding wheel, positioner and gage for checking drill angle.

Modular Diffuser Is Dirt-Proof and Has Low Price Tag

A small, standardized version of the Multi-Vent air diffuser is reported to offer the same advantages of draftless air conditioning and uniform temperature control but at lowered cost. The manufacturer states that the advantages of the panel unit also apply to heating and ventilating systems.

The diffuser, which is called "Modular" Multi-Vent, employs a perforated ceiling panel to introduce air into a room vertically and at low velocity. The perforations reduce the high velocity of air in the duct from 1,000 to 1,500 fpm to 40 or 50 fpm as it leaves the Multi-Vent panel.

Developed after three years of research, the modular unit is said to make possible low cost installations with wide flexibility. Further, it is reported to be suited to ceiling of acoustical treatment, illumination, fireproofing, and radiant heating and cooling.

The diffuser can be concealed completely if required, and it does not interfere with movement of partitions such as office walls and shelves. Walls or partitions can be moved adjacent to or even bisecting a panel without disturbing effective air distribution.

Dirt marks and smudges are said to be eliminated because the air leaving the diffuser moves vertically—away from the ceiling—rather than horizontally, preventing dirt impingement on these areas.

The modular diffuser panels are available for the most widely used types of ceilings—metal pan, plaster and acoustic tile—as well as for exposed duct applications.

The units run in price from $5.75 up. Eight Modular Multi-Vent units would be required in a room measuring 25x25x12 ft, having an average heat load. Total cost for the air diffusers in this "average" situation would be $46.00. Pyle-National Co., Dept. M-V, 1334 N. Kostner Ave., Chicago 51, Ill.

1-yd. MICHIGAN takes a heaping bucket-load . . .

The bonus in the bucket pays for this machine fast!

Take another look at the bucket in the photograph. It shows a typical MICHIGAN* bucket-load, heaped-up well over the rated capacity of the bucket—nearly a 50% bonus. Translate this bonus into your daily production and you'll see why a MICHIGAN Tractor Shovel pays for itself fast: you simply move more material with a MICHIGAN.

Tremendous digging ability. Get the bucket blade into hard-to-dig material or under a heavy obstacle and "work" the bucket until you've got a heaping load. The two double acting bucket cylinders are actually powerful enough (if the blade is under an immovable object) to pull the back wheels off the ground! We'll match the MICHIGAN'S digging ability against any make or type of Tractor Shovel, bar none.

Low-level bucket action. You can roll the bucket back only a few inches off the ground—heaping bucket-loads even when the material is scattered only a few inches high. And you can carry the full load *low*—your driver can *see* where he's going, he doesn't have to travel *backwards*.

No clutch—faster cycles. There's no clutch pedal on a MICHIGAN. You can actually shift between Forward and Reverse *while moving:* simply push the hand-lever on the steering column—MICHIGAN'S power-shift transmission shifts instantly. Power-shifting saves time and energy every cycle. Your operators will say: "This sure beats riding a heavy-duty clutch all day!"

See it in action—on your own job. Write us and we'll arrange a demonstration. MICHIGANS are built to handle jobs too tough for other rubber-tired Tractor Shovels—*let us prove it,* without obligation. Write for details on the pay-as-you-go MICHIGAN Lease Plan—you can put these machines to work without laying out a penny of capital.

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non-magnetic steel for the chemical, oil and packing industries . . . for ANY installation where high resistance to heat, acids, chemicals, and corrosion is needed.

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In both size and type, there is a Kerrigan Weldforged grating for every need. Let our new catalogs prove it to you. Send for the one you think best answers your need (or ask for ALL FOUR if you wish). We will also be glad to send you a desk-size grating sample. Write Kerrigan Iron Works, Inc., General Sales Office, 274 Madison Ave., New York City.

RIVETED STEEL
where it is desired to match existing grating.

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spark-proof for those whose need is strength AND lightness. Extra safe and strong. Allowable fiber stress 15,000 psi. Modulus of elasticity 10,000,000 psi.

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BOOKS

You Can Escape the A-Bomb

THE BOMB, SURVIVAL AND YOU—By Fred N. Severud and Anthony F. Merrill. 264 pp. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. $5.95.

TECHNICAL SUPPLEMENT TO THE BOMB, SURVIVAL AND YOU—By Fred N. Severud and Kurt Bernhard. 45 pp. Reinhold Publishing Corp. $2.50.

Much can be done now to save lives and reduce property damage from a future A-bomb or H-bomb blast. This book emphasizes that fact and offers many practical, low-cost suggestions ranging from construction of inexpensive home shelters and reinforcing of existing buildings to improved designs for future buildings.

The authors analyze the problems posed to city planners, building owners, civil defense officials and building designers by the development of nuclear weapons. They examine the nature of a nuclear blast and indicate the steps that can be taken for protection of life and property.

One of the authors—Severud—is an outstanding structural engineer. His recommendations for strengthening structures against blast should be considered seriously. Many of his suggestions are novel and very simple.

Nearly all the book's proposals for protective measures follow logically from past experience with the A-bomb. However, the authors offer one recommendation that in the light of information recently made available appears to be questionable: ". . . the likelihood that large masses of the population will spend hours at a time in shelters during an atomic attack does not follow a realistic understanding of the use of this new weapon. . . . The essence of our approach to the shelter question is this: the atomic bomb shelter must be designed for short-time use. . . ." Recently, the danger of radioactive fallout over a considerable distance from ground zero has been pointed out by the Atomic Energy Commission, and it now appears that a stay of several days in shelters might be necessary until radioactivity decays to a safe value.

The book is unusually well written and should be very useful to building designers in improving their concepts of the effects of nuclear weapons and in developing low-cost protective measures.

The technical supplement, a paper-covered booklet sold separately, presents a mathematical investigation of the deformations that might occur

US RUBBER

United States Rubber Company 4-year project pays off— leading operators report they are well ahead with U. S. Royal!

"Practically eliminated our downtime"
says P. Correale, Correale Construction, Hazleton, Pa.
"There's no tougher test for tires than anthracite coal stripping. Tire failure here can knock out a truck for a 7-hour shift—*for a $400 loss.* But U. S. Royal Con-Trak-Tors have practically *eliminated* our downtime."

Down Goes Downtime!

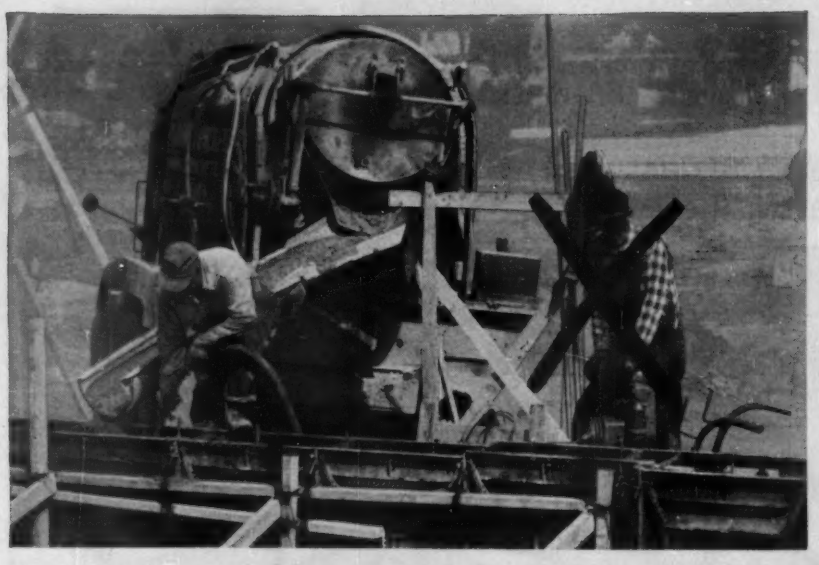
The new U. S. Royal Con-Trak-Tor—Full Lug, an important result of U. S. Royal's 4-Year Truck Tire Project, is cutting equipment downtime 'way down for leading operators like Correale Construction Company.

Good reasons, too! The Con-Trak-Tor's *Nylon cord carcass* stands up to vicious shocks, shrugs off rocks and snags. It has *triple impact protection*—extra rubber between plies, double shock-pads under the tread, extra-tough construction at the crown. Its *full lug traction* pulls right through toughest going, just *won't* bog down!

Why not let the Con-Trak-Tor prove it can reduce *your* downtime, lower *your* operating costs? Your U. S. Royal Dealer has this great tire in your size. Have him put it on your wheels—and prove to yourself why leading operators like Correale Construction Company report they're *well ahead* with U. S. Royals!

U.S. ROYAL NYLON CON-TRAK-TOR FULL LUG

ASK YOUR U. S. ROYAL DISTRIBUTOR TO SHOW YOU THE NEW FILM ON BETTER HIGHWAYS, "MEMO TO MARS"



NEW MASTER "1-MAN" VIBRATOR CUTS VIBRATING COSTS IN HALF

Only 25 lbs. Easy to handle.

It weighs 25 pounds! It's all in one piece! It plugs into any regular 115 Volt AC or DC electric line . . . and with no heavy engine or motor to drag around, one man handles it easily.

The motor is sealed in the vibrating head, so there's no flexible shaft to get out of whack; no oiling or greasing problems; no kinking troubles.

No field maintenance is necessary: when motor head needs attention, snap it off and snap on a spare.

The vibration actually penetrates farther and leaves fewer voids in the concrete than old-style vibrators.

The price is *low*. The design has eliminated so much cost, and no special power source is required, but the big saving comes in use. Write for folder or ask your Master distributor for a free demonstration. You'll see exactly how the Master "1-Man" can cut your vibrating costs *at least* 50%.

MASTER VIBRATOR COMPANY
604 Stanley Ave., Dayton 1, Ohio

MASTER

DRILLING CONTRACTORS

Diamond and Shot Core Borings
Dry Sample Borings
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Foundation Testing for Bridges, Dams and other Heavy Structures

Manufacturers, also of Diamond Core Drilling Machines and complete accessory equipment, including all types of Diamond Drilling Bits. Ask for Bulletin 320.

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NEW CONSTRUCTION AND REPAIRS

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- Repair all Types Disintegrated Concrete
- Dam Reconstruction and Repairs
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BOOKS

under blast loading in a one-way reinforced concrete slab. It is useful as a demonstration of the techniques required for an investigation of the effects of dynamic loading and nonelastic strains. The procedure adopted by the authors, however, appears to be too complicated for practical use in predicting the behavior of ordinary structures under blast loading.

How to Plan Schools

TOWARD BETTER SCHOOL DESIGN—by William W. Caudill. 271 pp. F. W. Dodge Corp. 119 W. 40th St., New York 18, N. Y. $12.75.

With the right approach, the author contends in this book, "our school building problems will unfold naturally into logical, simple and beautiful solutions." And the right approach, he believes, is to make school planning a problem-solving process.

The first step is to break complex problems into separate, relatively simple ones. Then, satisfactory solutions can be sought based on knowledge of the role the school plant plays in education and community relationships. Much helpful information for this purpose is given in chapters explaining the relationship of school plant to pupil, methods of education, indoor environment and city planning.

Of course, in evaluating any solution, costs must be considered. So the author wisely has included an informative chapter on the factors affecting economy.

As a further aid in applying the problem-solving approach to school design, the book also offers 91 brief case studies. Each states the specific problem, outlines the approach adopted to solve the problem and explains the particular solution. Material for the book was obtained not only from the author's experience as a specialist in school design but also from the experience of leading architects and educators and from research carried out at the Texas Engineering Experiment Station.

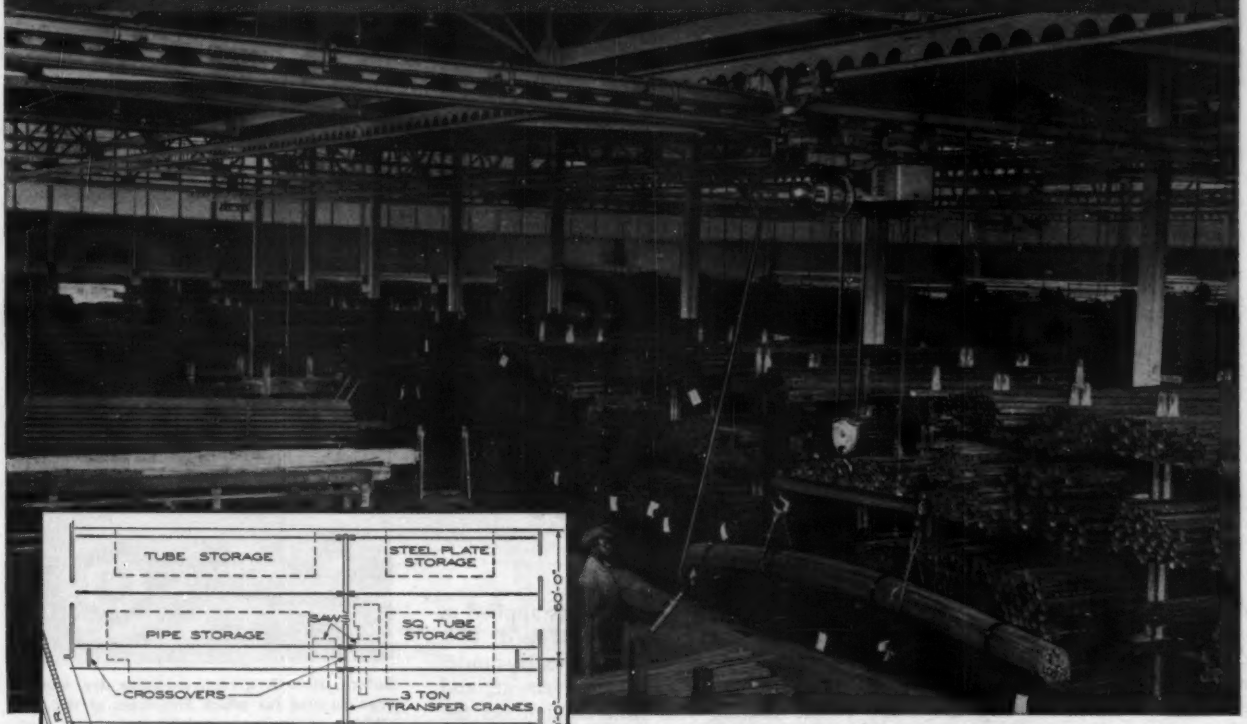
Reports and Pamphlets

PROCEEDINGS OF THE THIRD SOUTHERN MUNICIPAL AND INDUSTRIAL WASTE CONFERENCE—322 pp. The Technical Press, P. O. Box 5245, State College Station, Raleigh, N. C. $1.50.

PIPE FRICTION MANUAL—Hydraulic Institute, 122 East 42nd St., New York 17. $1.75.

VANDALISM AND OTHER ABUSE TESTS ON HIGHWAY SIGNS OF VARIOUS BASE MATERIALS—By Thomas H. Moran. Laboratory Report No. 65. Douglas Fir Plywood Assoc., Tacoma 2, Wash.

TRAMRAIL TRANSFER CRANES *SYSTEMATIZE* HANDLING IN STEEL WAREHOUSE



The large storage area is completely covered by Tramrail crane service. Every item can be seen from the floor and readily reached with the two transfer cranes.

▲ The Tramrail transfer cranes make it easy to place the long unwieldly pipes and bar stock into storage at any height. This makes for orderliness, which is an important factor in securing high operating efficiency.

THE BIG modern warehouse of J. M. Tull Metal & Supply Co., Atlanta, Georgia, was designed to make use of overhead Tramrail equipment to enable the handling of large unit loads in and out of storage with the least effort and in the quickest time.

The principal storage section is provided with two parallel runways each having three tracks. On both runways is a 64-foot transfer crane that travels the length of the room. Cross-overs are provided, enabling a hoist carrier transferring from one crane to the other. This makes it possible to haul materials between any two points in the entire area without rehandling.

Steel is constantly on the move in this active plant. From 60,000 to 70,000 lbs. are brought in by railroad car daily and like amounts are shipped out. The material is unloaded from railroad cars at one end of the building and placed into storage. It is shipped out on trucks which are loaded at the other end.

The overhead crane system makes it possible to place incoming materials into allotted storage spaces at once. The need of storing temporarily in aisleways or other areas and extra handling which this entails is eliminated. Thus, the warehouse is kept orderly at all times and every item is readily seen and conveniently reached. Danger of handling accidents is minimized and overall efficiency is unusually high.

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BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
3181 EAST 284 STREET, WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Bitumuls Black Seal puts new life in city streets

Bitumuls Black Seal, consisting of a single application of Bitumuls emulsified asphalt, puts new life in weathered pavement surfaces.

Engineers of Merced and Fresno, California, inspect pavement to be revitalized.

Before. Here is a representative dry, weathered surface for which Engineers of the City of Merced recommended Bitumuls Black Seal.

After. Notice the tight, uniform texture obtained by a single Black Seal application. No tendency toward fatness or bleeding.

Merced, California, treats 140,000 square yards at cost of $1050

A recent survey of residential streets in one section of Merced, California, indicated that the paved surfaces were starting to deteriorate at an alarming rate. Some were streets originally built of concrete and later resurfaced with a one-inch asphalt plant-mix overlay. Others were plant-mix surfacing on a rock base.

For those surfaces that were seriously cracked, broken or ravelled, specifications were drawn up calling for Bitumuls® Surface Treatments (either Single or Double, with chip-cover).

Preventive Maintenance Indicated

On many of the streets, however, the surfaces while still in relatively good condition were oxidized, dry and open-textured. The Engineers realized that unless some form of "preventive maintenance" were undertaken, these surfaces would soon require extensive repairs and possibly complete resurfacing. What they needed was a method of revitalizing these surfaces, plus the placement of additional binder to seal the interstices against water damage.

Bitumuls Black Seal Selected

After investigating several proposed methods, the Engineers decided on the use of Bitumuls Black Seal to rectify the situation. For this work 0.1 gal. per sq. yd. of (1:1) diluted Bitumuls SS-2 emulsified asphalt was applied to the surfaces. No cover was used. This treatment provided the necessary binder to adequately seal the pavement, and the coating was thin enough on the high spots to prevent pick-up under traffic which was allowed over the pavement within one hour.

Adaptable To Wide Application

Costs of the Black Seal work and for the other Bitumuls Surface Treatments are given in the table below.

Dry and open-textured paved surfaces are not peculiar to Merced. This method of economically extending pavement life merits investigation by communities in every part of the country. *Specifications on Black Seal, and on Bitumuls Surface Treatments, are available on request.*

COST SUMMARY

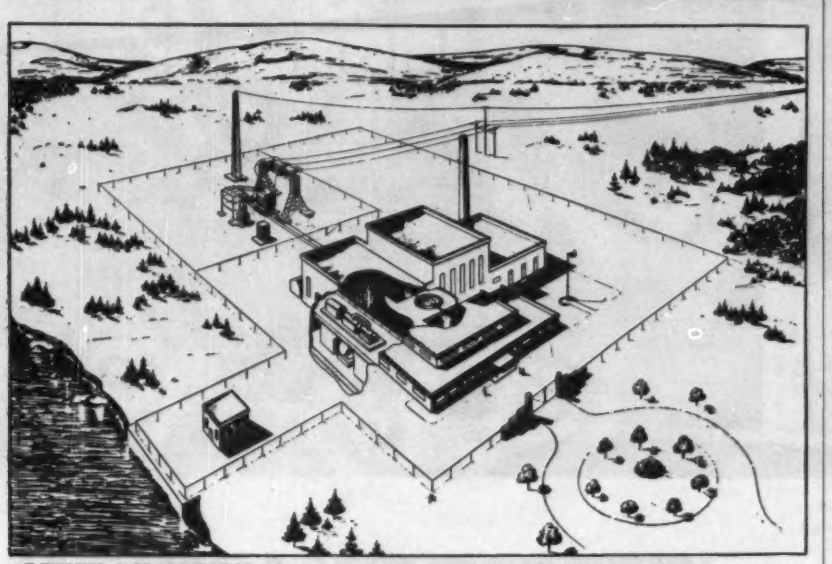
ITEM	I Black Seal	II Single Chip Seal with Black Seal	III Double Chip Seal with Black Seal
Labor (including Rock Haul)	$210	$168	$602
Bitumuls RS-1 at 10c per gal.		160	829
Bitumuls SS-2 at 11c per gal.	840	90	396
½" Crushed Rock at $2.35 per ton			668
⅜" Crushed Rock at $2.35 per ton		151	
¼" Crushed Rock at $3.35 per ton			50
Total Cost (labor & materials)	$1050	$569	$2945
Total Square Yards	140,000	6240	16,090
Cost per square yard (labor & materials)	$.0075	$.0913	$.183

Note: Cost does not include equipment rental.

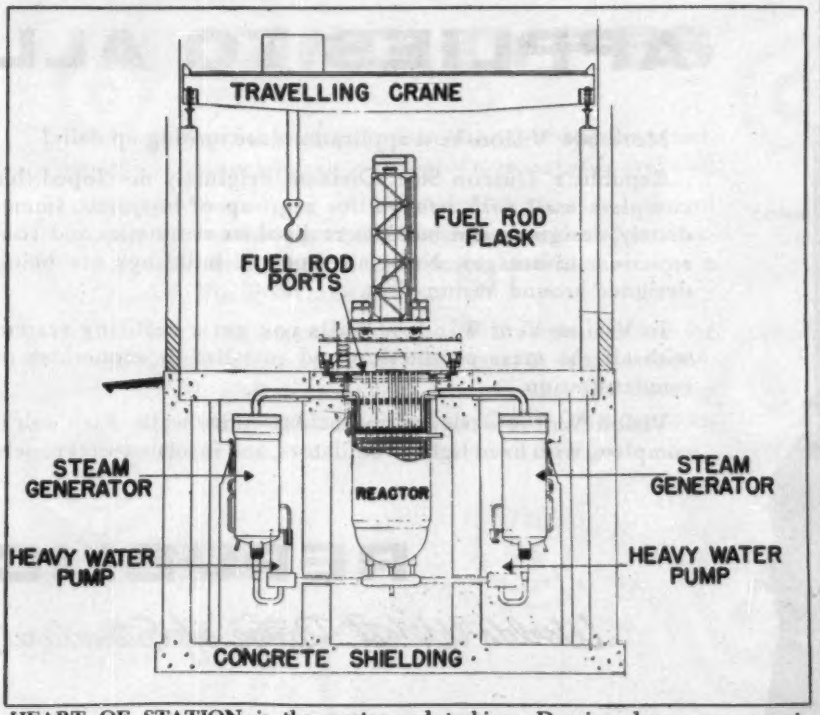
AMERICAN Bitumuls & Asphalt COMPANY

200 BUSH STREET • SAN FRANCISCO 4, CALIFORNIA

E. Providence 14, R. I. Perth Amboy, N. J. Baltimore 3, Md. Mobile, Ala. Cincinnati 38, Ohio Columbus 15, Ohio Tucson, Ariz. Seattle, Wash. Baton Rouge 2, La. St. Louis 17, Mo. Inglewood, Calif. Oakland 1, Calif. Portland 7, Ore. Washington 5, D. C. San Juan 23, P. R.



ARTIST'S CONCEPTION shows general layout of Canada's first atomic power station.



HEART OF STATION is the reactor and turbines. Drawing shows arrangement.

Canada Reveals Atomic Generator Plan

A preliminary description of Canada's first atomic power station—known as the "Nuclear Power Demonstration"—has been presented at the Canadian exhibit at the International Conference on the Peaceful Uses of Atomic Energy in Geneva.

The station is to be built by a combined force of engineers and scientists employed by government and private industry and will be located at the power station of the Hydro-Electric Power Commission of Ontario near the village of Des Joachims on the Ottawa River, about 150 miles northwest of Ottawa. It will be an experimental station, generating from 10,000 to 20,000 kw, and the cost of the power produced is not expected to be

(*Continued on page 62*)

HOW TO RUB or GRIND CONCRETE

Today, more and more builders specify a fine finish for concrete walls and ceilings. Because of this new requirement, and the time and expense involved for hand finishing large areas; Stow Manufacturing Company has developed two easily portable flexible shaft grinders for finishing concrete. These grinders are electrically powered.

Two methods are used to smooth off hardened concrete: wet rubbing and dry grinding.

Wet Rubbing—required for smoothing green concrete to a plaster-like finish. Use slow speed grinding wheel or disc. Apply water while grinding. Wet concrete can also be painted on with a brush, then smoothed into holes with the grinding wheel.

Dry Grinding—use a high speed grinding wheel or abrasive disc to smooth dry concrete.

Either of Stow's portable, electric grinders, the ½ HP model G40-C or the ¾ HP model JT-50, can be used for wet or dry grinding. Both models are available with open or totally enclosed motors, and are equipped with 8 or 12-ft. flexible shafts. Angle heads with different speed ratios can be selected. Write for STOW'S pamphlet, *Grinding Concrete* for complete information on proper speeds, grinding discs and wheels for both wet and dry concrete finishing. Stow Manufacturing Co., Binghamton, N. Y. also makes a complete line of concrete vibrators, rotary trowels, and screeds.

STOW MANUFACTURING CO.
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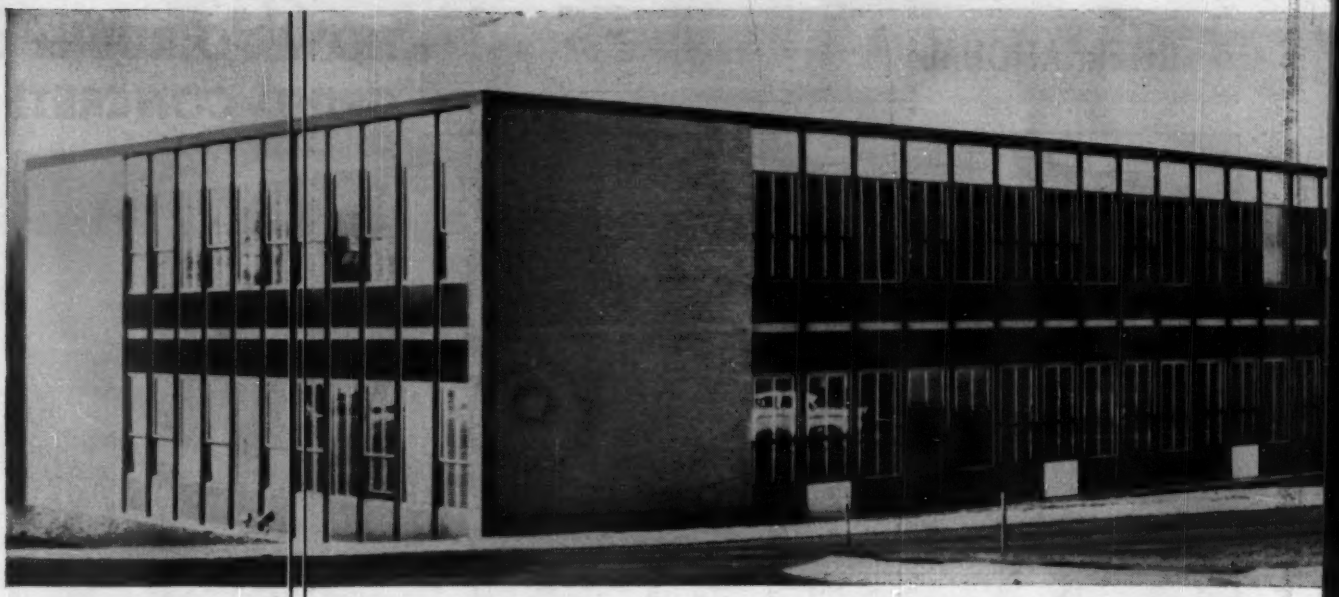
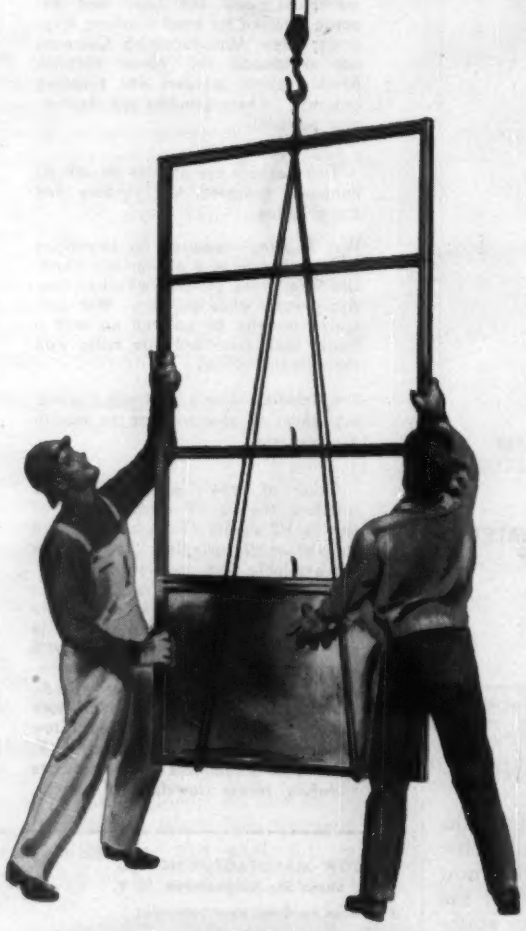
Company.....
City..... Zone.... State.....





TRUSCON VISION-APPLIES TO ALL

More new Vision-Vent applications are turning up daily!

Republic's Truscon Steel Division originally developed this complete *wall with window* for a group of hospitals. Immediately, designers and builders realized its economies and construction advantages. Now, all types of buildings are being designed around Vision-Vent.

In Vision-Vent Window Walls you get a building system with all the mass-production and installation economies of standardization.

Vision-Vent is designed to enclose entire walls. Each unit is complete, with fixed lights, ventilators, and insulated steel panels.

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World's Widest Range of Standard

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NEW BUILDINGS NEED SUPPLIES; AND SUPPLIES NEED STEEL SHELVING for most efficient storage. Republic's Berger Division pioneered in the manufacture of high-quality steel shelving and in "storage engineering"; Berger offers exclusive "Wedge-Lock"—world's strongest steel shelving—capable of carrying heaviest loads. New Berger Clip-Type Convertible Steel Shelving gives you fast, easy shelf adjustment.

VENT ECONOMY BUILDING TYPES

Panels can be either colored porcelain enamel or stainless steel. They have a "U" factor equivalent to that of masonry spandrel wall.

Since Vision-Vent offers a minimum wall thickness—less than 1½"—you gain extra floor space. Light weight is reflected in structural savings. Erection is done from inside and can average a floor-a-day rate. Vision-Vent is weathertight.

This exciting new Truscon development is recommended for all types of single and multi-story buildings. Truscon window engineers will be glad to study your requirements and develop specific design details and costs. See Sweet's File for more facts, or send coupon.

STEEL

Steels and Steel Products

Typical VISION-VENT applications

HOSPITALS

Memorial Hospital Ass'n. of Kentucky, Inc.
Sherlock, Smith and Adams, architects;
J. A. Jones Construction Co., contractors.

Memorial Hospital Ass'n. of Kentucky, Inc.
Office of York and Sawyer, Kiff, Colean, Voss and Souder, architects;
J. A. Jones Construction Co., contractors.

Memorial Hospital Ass'n. of Kentucky, Inc.
Isadore and Zachary Rosenfield, architects;
J. A. Jones Construction Co., contractors.

Hebrew Home for the Aged, Hartford, Conn.
Kane and Fairchild, architects;
South New England Construction Co., contractors.

Bel-Park Medical Bldg., Youngstown, Ohio
P. Arthur D'Orazio, architect;
Emanuel Katzman & Co., contractors.

SCHOOLS

Clemson College Dormitories
W. G. Lyles, Bissett, Carlisle and Wolf, architects;
Daniel Construction Co., Inc., contractors.

Holy Cross School and Convent, Bronx, N. Y.
Office of York and Sawyer, Kiff, Colean, Voss & Souder, architects;
James King & Son, Inc., contractors.

Animal Science Bldg., University of Arkansas
Ginocchio, Cromwell and Assoc., architects;
Harmon Construction Co., contractors.

Eastern Jr. High School, Greenwich, Conn.
J. Gordon Carr, architect;
Alfonso Alvarez, cons. school architect;
A. Barbaresi & Son, Inc., contractors.

Elementary School for Retarded Children, Columbus, Ohio.
Richard Hawley Cutting, architect;
Sever-Williams Co., contractors.

Classroom and Office Bldg., Univ. of California at Los Angeles.
Austin, Field & Fry, architects;
Robert E. McKee, contractors.

COMMERCIAL BUILDINGS

United Airlines Finance and Property Bldg., Chicago, Ill.
Skidmore, Owings and Merrill, architects;
Algot B. Larson, Inc., contractors.

Fram Office Building, East Providence, R. I.
The Architects Collaborative, architects; Gilbane Bldg. Co., contractors.

Michigan Bell Telephone Co., A.M.A. Office Bldg., Port Huron, Mich.
Smith, Hinchman & Grylls, Archts. & Engrs.;
E. J. Kahmann, contractors.

Penn Controls, Inc., Goshen, Ind.
The Austin Co., architects and contractors.

INDUSTRIAL BUILDINGS

Fermenter Room Bldg., Brown Forman Distillers Corp.
Joseph & Joseph, architects;
F. W. Owens Construction Co., contractors.

PUBLIC BUILDINGS

City Hall, Bakersfield, California
Robert N. Eddy, architect;
William T. Wheeler, engineer;
Brooks-Williams-Macco, contractors.

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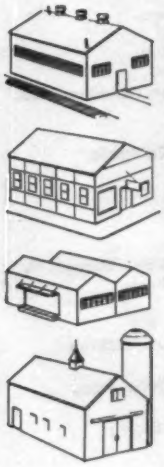

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competitive with that produced by hydro or conventional thermal stations. Operation is scheduled for 1958.

The main objectives of such a station of low power rating are to demonstrate the feasibility of generating electricity with an atomic plant of such a design and to provide information for the construction and operation of a large-scale plant. The small-scale operation will also be helpful in deriving practical data on the economics of power production with nuclear plants and experience will be gained in design and operation, particularly on those aspects which differ from research reactors. Further, the pilot operation will serve to train personnel, both in plant design and in operation.

While the design and construction of the Nuclear Power Demonstration goes forward, a preliminary design study for a 100,000 kw station will be carried out by a group composed of engineers and scientists from various power companies throughout Canada and from the staff of Atomic Energy of Canada, Ltd. The detailed design and construction of such a station, and of future atomic power stations in Canada, would be the joint responsibility of private industry and of the various power companies.

The estimated cost of a 20,000 kw plant of the design envisioned is just over $11 million. This figure does not include the cost of development work nor the cost of the land. Atomic Energy of Canada, Ltd. will pay the major portion of the cost of the reactor, which has been estimated at about $8 million, provide nuclear data and be responsible for the nuclear performance of the plant. This company will provide the fuel and the moderator and will process used fuel elements at Chalk River.

The Canadian General Electric Co., Ltd. is responsible for the detailed design and engineering of the reactor and for all construction, and will contribute $2 million toward its cost. The conventional part of the plant (turbine, electrical generator, and transmission gear) will be designed and paid for by Ontario's Hydro-Electric Power Commission, which also will operate the plant and feed the electricity produced into its Ontario power network. The Commission has agreed to buy steam from Atomic Energy of Canada, Ltd. and A. E. C. L. will reimburse the Commission for the operating costs of the reactor.

The reactor will use natural uranium for fuel, possibly slightly enriched with plutonium, and heavy water for the moderator of neutrons—fast neutrons are given off when uranium-235 atoms split and they must be slowed down or "moderated" by some medium that does not capture neutrons readily before they will split other uranium-235 atoms and thus maintain a chain reaction. The fuel will be in the form of about 200 rods sheathed in zirconium.

The fuel rods of three previously constructed reactors are sheathed in aluminum but this metal would not withstand the corrosiveness of heavy water at the higher temperatures which will prevail in the current project. The uranium must be sheathed not only to prevent its corrosion by the heavy water, but also to retain the highly radioactive fission products which are formed when uranium atoms split or fission.

There will be two heavy water systems. One volume of heavy water will act as the moderator of the neutrons —this will not be in contact with the fuel rods—but will be circulated through heat exchangers to keep its temperature between 60 and 260 F. The other heavy water system will be the "coolant"— that is, it will carry the heat given off by the fissioning uranium to the steam generators. In this case the heavy water will flow through tubes surrounding the fuel rods and when it leaves the reactor en route to the steam generators it will be at a temperature of about 500 F.

This hot heavy water will flow through two steam generators where it will give up its heat to ordinary water which will be converted into steam. The steam will drive a turbine, as in a conventional thermal power station, and the turbine will drive electrical generators.

To prevent the coolant from boiling, the reactor will be placed within a steel pressure vessel where the pressure will be 1,200 psi or higher.

The core of the reactor will be about 10 ft in dia and about 10 ft high. Around the outside of the core, aluminum tubes containing ordinary water may be wrapped to form the "reflector," which reflects escaping neutrons back into the core. The reflector design has not been settled and, therefore, this arrangement is tentative.

The rate at which the uranium "burns" within the reactor depends upon the amount of moderator present and also upon the amount of neutron-swallowing material within the core.

With the proposed unit, it is possible that control will be achieved by changing the quantity of heavy water moderator in the core. Thus there may

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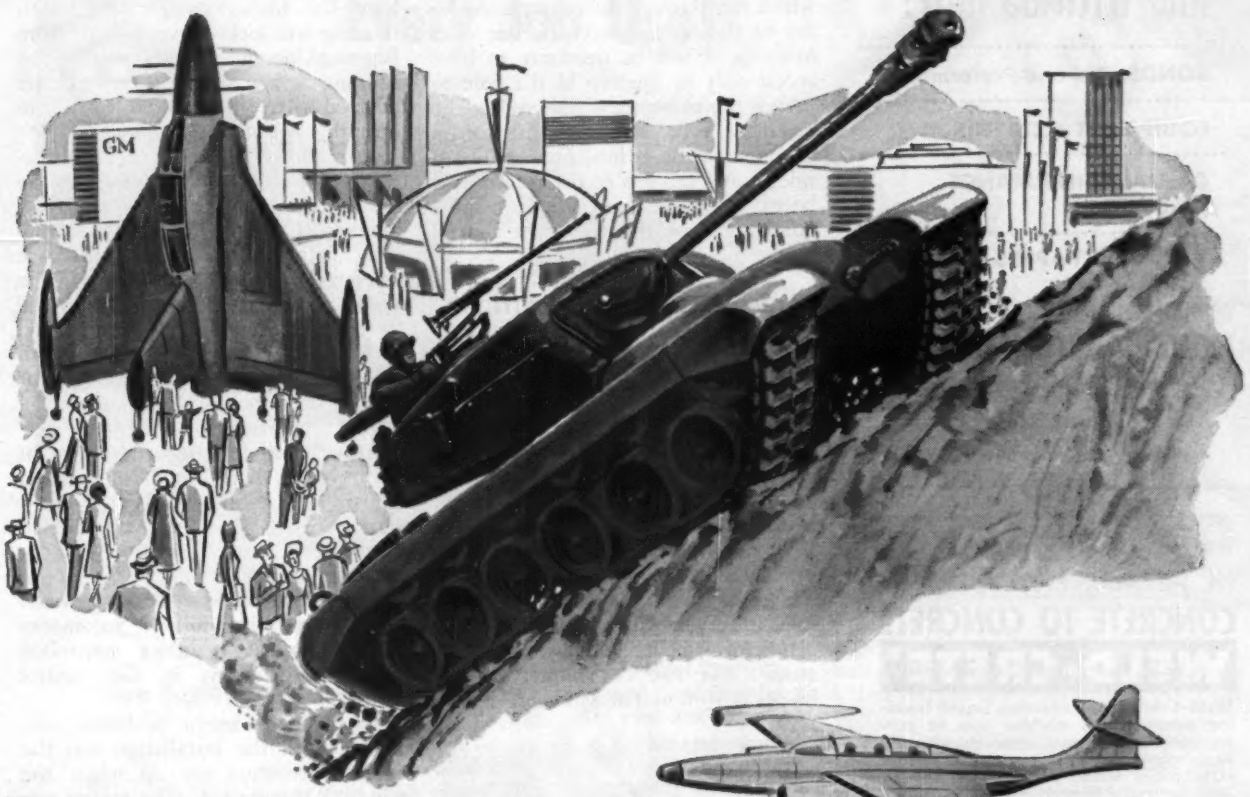

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It's the General Motors Powerama created to celebrate the building of GM's 100,000,000th Diesel horsepower – staged at a fabulous wonderland on Chicago's Lake Front.

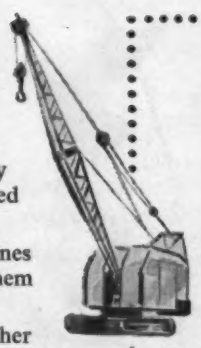
Here you'll see Allison TORQMATIC DRIVES smoothly transmitting Diesel engine power – see why these proved drives make any engine run better, more efficiently.

You'll see a wide range of TORQMATIC-equipped machines in action, watch them speed through their paces, see them change the face of the earth.

You'll watch TORQMATIC-equipped Army tanks and other military vehicles performing breath-taking maneuvers – see twin-jet Scorpions and a sensational VTO interceptor, both powered by Allison aircraft engines.

And here you'll see a brand-new idea in the world of entertainment—the first Technological Circus—"More Power to You"—an amazing combination of circus thrills—vehicular skills and big-time entertainment.

And best of all, *it's all free.* So bring the family – they'll enjoy it just as much as you.



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Weld-Crete is the amazing liquid bonding agent which enables you to *permanently* bond new concrete *directly* to old concrete . . . or to most any other structurally sound surface . . . *without need for costly, time-consuming chipping, drilling, roughening, acid washing or scarifying of concrete base.*

Weld-Crete has equal bonding permanence all climates, all surfaces, all sorts of conditions. When used with quick setting cement topping you can lay new floors, ramps, driveways, etc. one day and run heavy truck traffic over them the next. Get facts from your building materials supply dealer or write Larsen Products Corp., Box 5756-I, Bethesda, Md.

TYPICAL WELD-CRETE APPLICATION

National Brick Co., Terra Cotta, D.C.

Here Weld-Crete was used to bond new ¾" concrete topping directly to old, badly chipped and spalled floor slab which had been subjected to ceaseless heavy truck traffic. Plant shut-down time eliminated as Weld-Crete enabled National's own mechanics to do job over week end.

not be a control rod such as the cadmium rod in previous designs. One advantage of this arrangement would be that there would not be mechanical equipment inside a pressure vessel. However, the method of control is not definitely settled and a control rod may be used.

Early experimental reactors were designed to rise above their main floors. This allows experimental apparatus to be placed against neutron beam holes which run through the concrete shielding to the reactor core. In this case, however, it will be necessary to have access only to the top of the core to permit the changing of fuel rods. The reactor can therefore be sunk into a basement, with its heat exchangers beside it, and the top of the reactor will be on the same level as the turbine operating floor and the main control room.

Attempt to Make Electricity From Wind Power Successful

After four years of research and experiment, a British attempt to generate electricity from wind power has culminated in success. The pilot project consists of a 100 kw windmill erected on the Orkney Islands north of Scotland. Results obtained have been such that a design for a 250 kw unit is underway.

The test windmill consists of a 78-ft steel tower on which is mounted the generator nacelle, gearbox and rotor arms. The swept diameter of the blades is 50 ft and at winds of 35 mph or above they generate full power.

EARLY MODEL windmill was erected in 1951 to originate wind power experiment.

The blades are of compressed laminated wood with steel fittings. Each is attached to the end of the hub arm by hinged joints which allow it to "cone" or lean forward with the wind forces and also to lean in the direction of rotation. The hinges are designed to remove excessive bending stress that would otherwise be set up.

The thrust of the wind is opposed by centrifugal force which tends to keep the blades straight out when running and locks prevent them from flapping loosely when stationary or running at low speed. The locks are released when the windmill runs up to operating speed.

In order to prevent excessive vibration of the blades when running, the movement of the blades on their hinges is controlled by hydraulic dampers. Furthermore, the hub and blade assembly faces down wind to avoid the possibility that the blades will hit the tower as they revolve.

There is a small "pilot" windmill mounted on top of the nacelle for control purposes. Rotating at a speed proportional to the wind velocity, the "pilot" signals the main control gear when the windmill should be started or stopped. To prevent a start from a gust in an otherwise calm period, the control gear averages the wind speed over a number of minutes. Once the signal to start has been given, everything follows automatically in correct sequence controlled by electrical relays in the control house.

One of the major problems connected with the installation was the intense vibration set up when the windmill was started. The project was nearly abandoned, but reducing the size of the blades all but removed this effect.

The Scottish firm of John Brown & Co., Ltd. carried out the design and construction under commission from Britain's North of Scotland Hydro-Electric Board.

Plans Made for Tigris Hydroelectric Project

Iraq's Development Board has decided to build a reservoir and hydro plant on the Tigris River at Easki Mosul, 16 mi north of Mosul. Cost of the project is estimated at $47.6 million.

The dam will be 80 meters high and will have a storage capacity of 8,000,000 cu meters. The Board's First Technical Section has been asked for a list of consulting engineers qualified to prepare plans for the project.

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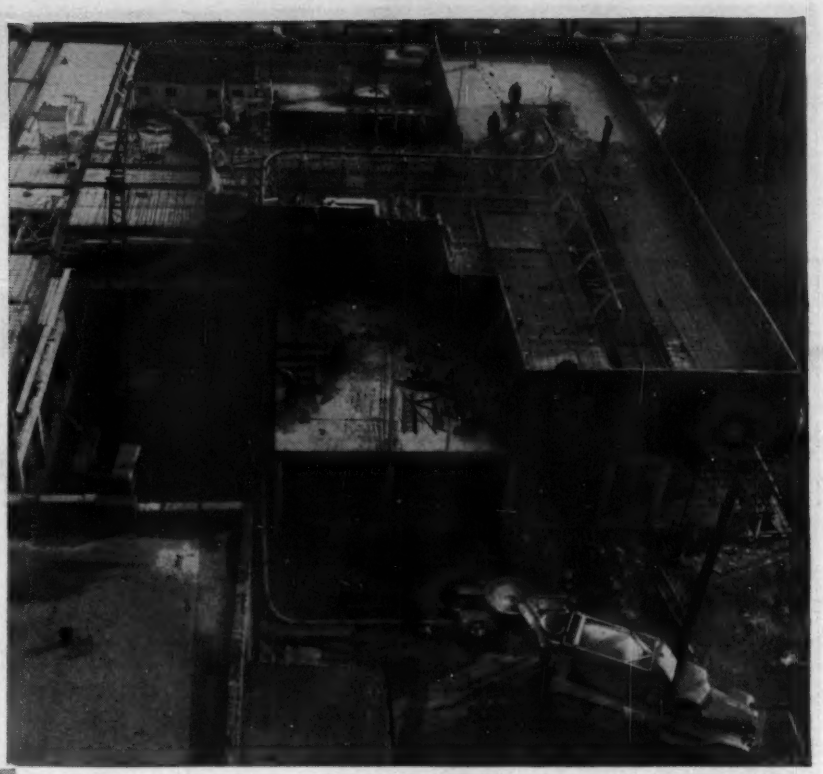


Pumpcrete® is located in the alley where it is accessible to truck mixers and away from traffic. Concrete is delivered to third floor of "H" shaped building by pipeline, 160 feet from alley. Note pipeline set in place for pour on other half of floor.

Small crew distributes and vibrates concrete in place. Note absence of cumbersome runways and buggies. Pumpcrete placed approximately 2200 yards of concrete for the building, averaging 15-18 yards per hour.

Reports: "nice going... with PUMPCRETE!"

concrete by pipeline saves time and money on new Chicago building

By eliminating conventional concrete-handling equipment—buggies, runways, lifts—contractor for this four-story "H" shaped structure on Chicago's North Side was able to place concrete at less cost, faster and better with Pumpcrete—the pump that delivers concrete by pipeline!

Construction supervisor Harold Arnold of Sumner Sollitt Company, Chicago, reported Pumpcrete eliminated expensive handling equipment. Iron workers, electricians and other trades were able to work on schedule, undisturbed by placing operations—"it's nice going with Pumpcrete."

The single Model 160 Pumpcrete was located in the alley to the rear of the building . . . out of the way of street traffic and easily accessible to truck mixers. This arrangement relieved traffic congestion and expedited over-all job progress.

Investigate the job-speeding, cost-cutting advantages of Pumpcrete on your next job. See your local Rex Distributor or write Chain Belt Company, 4633 West Greenfield Ave., Milwaukee 1, Wisconsin.

CONSTRUCTION REX MACHINERY

CHAIN BELT COMPANY

E. P. Light

Elected Vice President Of Cunningham-Limp Co.

Eugene P. Light, president of Cunningham Engineers, Inc., has been elected a vice president of Cunningham-Limp Company, general contractors, Detroit, Mich.

Before joining Cunningham-Limp last January, Light was associated with the Austin Company for 19 years.

His appointment as vice president is the first of several which the company expects to make as it enlarges its facilities and manpower to meet the increasing volume of its project contracts.

A civil engineering graduate of Ohio Northern University, Light was an engineer with the Ohio State Highway Department until he joined the Austin Company in 1936.

Ellis S. Tisdale Retires From Public Health Service

Ellis S. Tisdale, sanitary engineer director, will retire from the Public Health Service, U. S. Department of Health, Education and Welfare, on Sept. 1, after 18 years of service. He has accepted appointment as director of the Interstate Commission on the Potomac River Basin.

Commissioned in 1938, Tisdale was first sanitary engineer reserve officer in the Public Health Service. His assignments have included service with the War Manpower Commission and training duties at the National Institute of Health in Bethesda, Md., and at the Communicable Disease Center in Atlanta, Ga.

He became regional engineer in the Atlanta office in 1954 and was transferred to the Washington headquarters last March to assist in developing a national register of sanitary engineers.

A native of Massachusetts, Tisdale received a degree in sanitary engineering from M.I.T. in 1915 and spent the first 22 years of his career with the West Virginia Health Department.

Minnesota AGC Encourages Study of Civil Engineering

To help meet the increased demand for professionally trained civil engineers, the Associated General Contractors of Minnesota, Inc., has established a scholarship fund at the University of Minnesota.

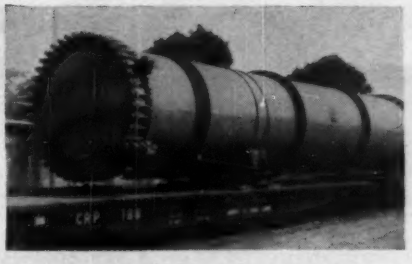
Next year, five $300 scholarships will be available to Minnesota students who have completed two or more years of engineering study and who will continue their training in the Institute of Technology at the University of Minnesota.

Students selected for the awards will participate in AGC activities during the year, will be employed by contractors during summer months if they desire, and will receive the association's publications.

An engineering education subcom-

Elected Port President

John F. Tulloch, Oakland contractor, has been elected president of the Board of Port Commissioners, Oakland, Calif. He has served as a member of the board for the last four years.



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• Whatever your needs in pressure vessels—creosoting cylinders, bubble towers, gas scrubbers, pressure spheres, gas storage tanks, etc. —you can depend on COLE for vessels that are *correct* in design and permanently leakproof at the welded or riveted joints.

We also design and fabricate elevated tanks, acid tanks, dye-vats, digestors, standpipes, storage tanks, etc. Write for latest COLE catalog —*Tank Talk.*

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Earle Operating Machinery, now in use on many of the nation's finest movable bridges, is renowned for its dependable power, long life and economical operation. Machinery is another member of the famous Earle line of precision-made products that include gears and speed reducers.
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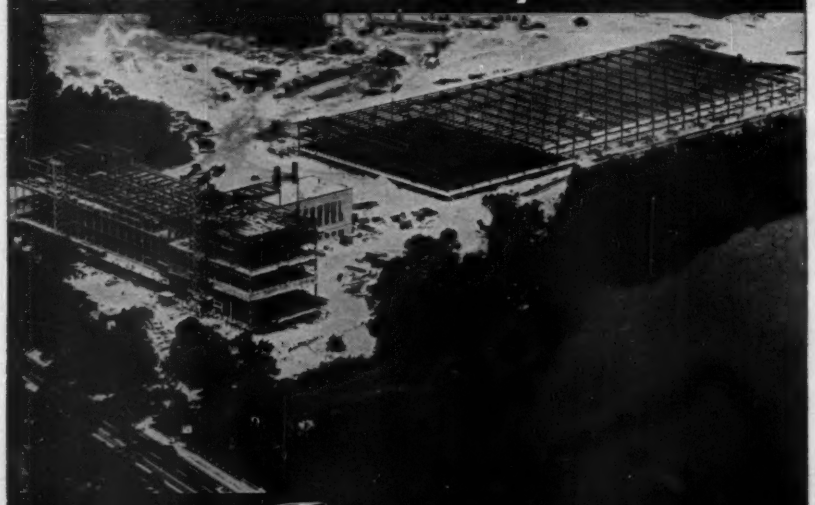

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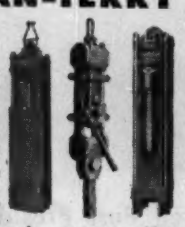

Now made in complete standardized line of 11 double-acting hammers, 5 single-acting hammers and 2 double-acting extractors. Also Sand Drain Equipment and Steam Generators.

Write for free descriptive Bulletins.
Also builders of coal and ore bridges and unloaders, and specially designed machinery.

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mittee has been established by the AGC to study additional ways and means of encouraging young men to enter the construction industry.

Harley, Ellington & Day Elect Three New Officers

Paul B. Brown, Frederick J. Hildebrandt and Alfred H. Mitschke have been elected vice presidents of Harley, Ellington & Day, Inc., architects and engineers, Detroit, Mich.

A graduate of the University of Michigan, Brown joined the firm in 1939 and has been serving as project administrator. Construction work with which he has been associated includes the University of Detroit expansion, Michigan National Guard Armories and the Michigan Life Insurance Company Building.

Hildebrandt, a University of Michigan civil engineer who joined the firm in 1944, has been in charge of all construction contracts and nationwide operations. As the firm's construction manager, he has been responsible for field forces working on projects located across the country and in Canada.

Mitschke joined the firm in 1934 and for the first ten years served as construction superintendent and structural engineer. Recently he has been project administrator on beverage plant construction.

Pittsburgh Contractors Appoint New Executive

Booth & Flinn Company, general contractors in Pittsburgh, Pa., has announced the election of L. S. Stanley as a vice president.

For the last two and a half years

L. S. Stanley

REPUBLIC NATIONAL BANK BUILDING, DALLAS, TEXAS

the tallest building in the southwest uses

the largest selling perlite aggregate in the world

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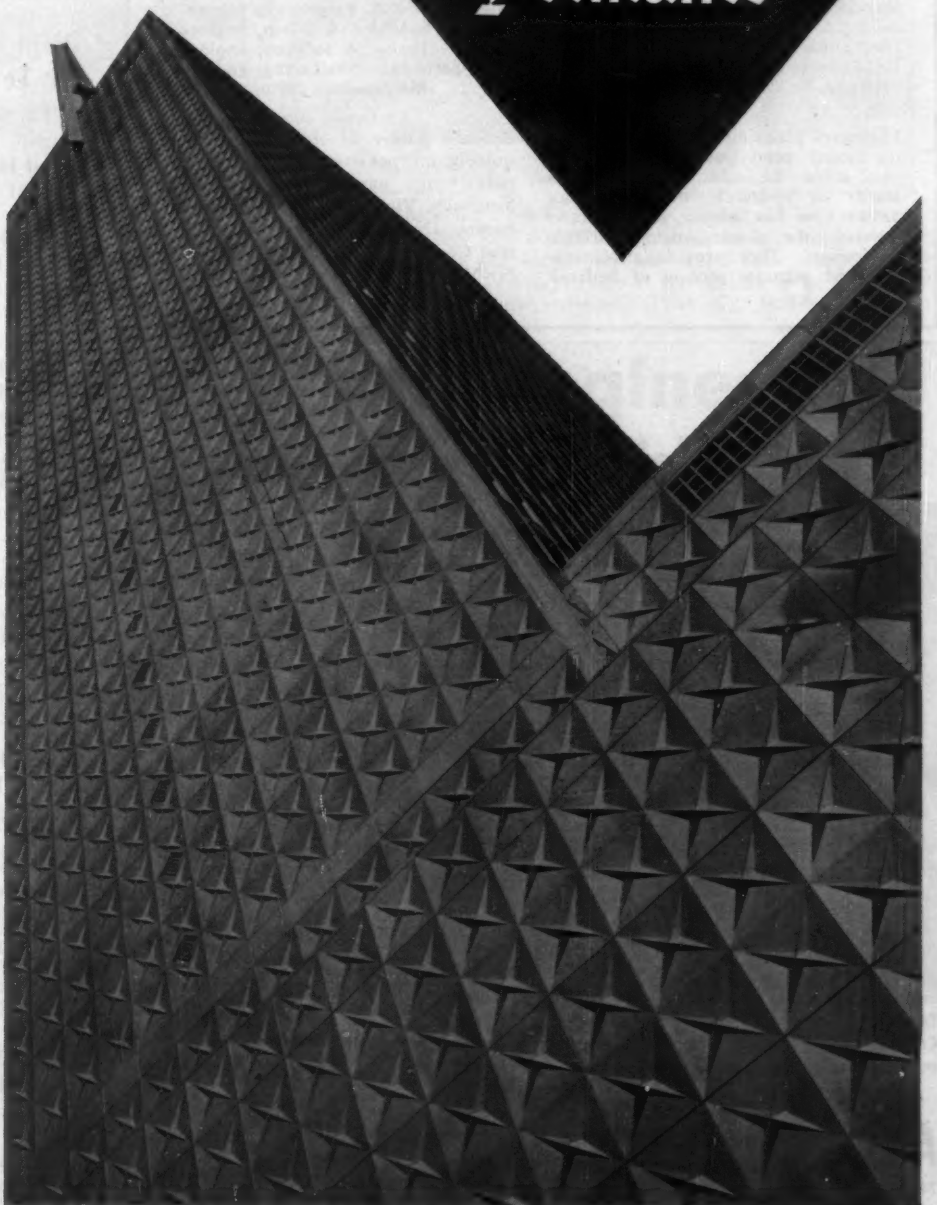

PERMALITE perlite aggregate plaster, used to fireproof structural members, provides 4-hour fire rating.

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PERMALITE used in modern lightweight construction increases the ratio of pay-load to dead-load and makes possible substantial savings in structural steel.

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j. w. bateson co., inc., dallas

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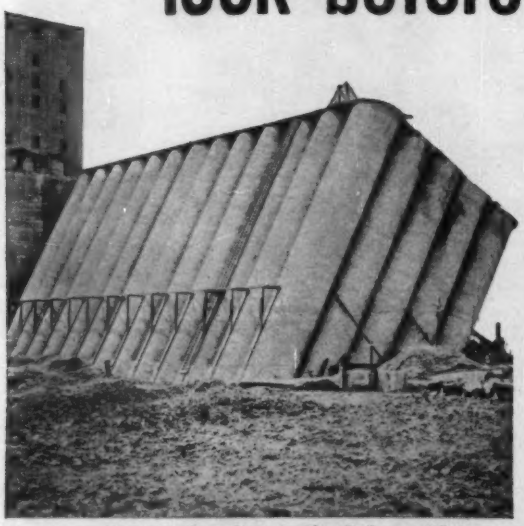
GEOPHYSICAL SURVEYS

LOCATION	CLIENT
East River, New York City	Consolidated Edison Company
Shelton Well Field	Bridgeport Hydraulic Company
The Connecticut Expressway	Ammann & Whitney, Engineers
Casco Bay Power Project	Central Maine Power Company
Delaware River Power Project	Jackson & Moreland Co., Engineers
Southeast Expressway, Mass.	Massachusetts Dept. of Public Works
Narrows Bridge Site, Brooklyn & Staten Is., N. Y.	Ammann & Whitney, Engineers
125th Street Bridge Site, N. Y. C.	Ammann & Whitney, Engineers
Narragansett Bay	New England Power Service Company
Baker River (Wash.) Hydraulic Development	Stone & Webster, Engineers
St. Lawrence Power Project	Sanderson & Porter, Engineers
Massachusetts Turnpike	Howard-Needles-Tammen & Bergendoff, Engineers
Garden State Parkway, New Jersey	Goodkind & O'Dea, Engineers
The Connecticut Expressway	Loomis & Sullivan, Engineers
The Connecticut Expressway	Knappen-Tippetts-Abbett-McCarthy, Engineers
Portland, Pa. Power Plant	Metropolitan Edison Company

Engineers planning heavy construction no longer need put up with spotty data about the subsoil. Gahagan (a leader in hydraulic dredging since 1898) now has seismic survey crews covering the country, using portable equipment. They provide a continuous and accurate picture of bedrock and the nature of the overburden—quickly, inexpensively. For further details, write, wire or telephone Ken Sandbach, Vice President, Geophysical Survey Division, Gahagan Construction Corp., 90 Broad St., New York 4, N. Y. Telephone: Whitehall 3-2558.

look before you lean



Transcona Elevator, Canadian Pacific Railway, Winnepeg, Canada, which tipped 27°—righted by the Foundation Company Ltd. of Canada.

An elevator tips—a bridge sags—a building settles—a dam goes out—costly and serious mistakes in construction work. That's why it pays to make test borings before designing foundations. And, when you investigate subsoil conditions, you want the best—ACKER! For, Acker makes a complete line of low-cost, easy-to-operate soil sampling equipment—from hand to power driven tools.

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Stanley has been contracting engineer for the firm. He will continue to supervise the engineering of industrial foundations and other heavy construction and will be responsible for obtaining new business.

According to the board of directors, his election will facilitate the handling of a greater share of the anticipated nationwide increase in construction.

Stanley joined Booth & Flinn in 1930—a year after he received his degree in architectural engineering from Ohio State University. He was assigned first as field engineer for the construction of the Gulf Building foundation in Pittsburgh, and later served as superintendent, designer and office engineer.

Diehl Heads Up New Plant Of Texas Portland Cement

The Texas Portland Cement Co., Austin, Texas, has elected Kent Diehl, Sr. of Houston as president of its new cement plant to be built at Echo, Texas.

Diehl will engineer and supervise the building of the $3-million plant which will occupy a 36-acre tract north of Orange.

A graduate of Detroit University, Diehl has been in the cement business for 37 years. He is the former president and general manager of Gulf Portland Cement Corp. of Houston, and is assistant to the president of Kennedy Van Saun Manufacturing and Engineering Co. of New York, builders of portland cement plants.

He has supervised and engineered cement plant construction in Africa, Italy, France, Formosa and Indonesia; has been a consultant to 11 foreign governments on cement manufacture and cement plant building; and has served as special engineer to several cement companies in the United States. His work includes invention of the bulk oil well cementing process used by Halliburton Oil Well Cementing Co. throughout the world.

The new plant with which Diehl will be associated has an estimated capacity of 1,500 barrels a day and will utilize sea shell as a basic ingredient in cement manufacture. A contract has been awarded to S. Perry Brown Co. of Houston for construction of a 1,200-ft channel off the Sabine River for the company's six shell barges. Technical personnel and engineers for the plant will be furnished by the Kennedy Van Saun Company of New York, which will guarantee the rated output for one year.

(*Men and Jobs continued on page 72*)

"Easiest handling truck I ever drove," says H. E. Williams of his Ford T-800 BIG JOB. "Power Steering is a mighty big help. Couldn't get along without it." Power Steering is standard on the T-800. For power, the Short Stroke 170-h.p. *Cargo King* V-8. New, increased GVW of 42,000 lbs.

"Ford's Short Stroke engines take any amount of punishment"

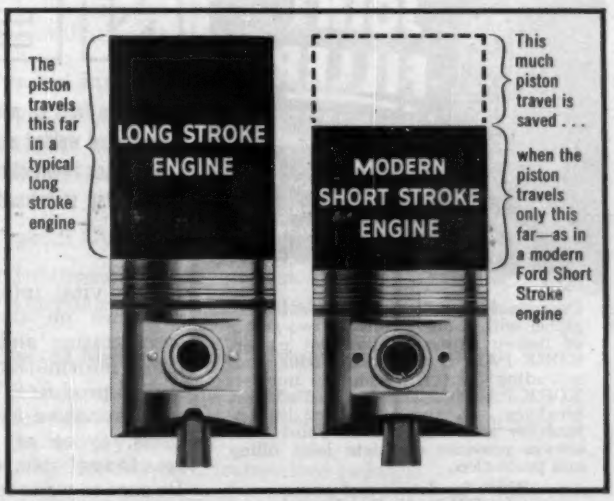
"A truck engine has to take a real beating in my kind of work, but this Ford Short Stroke engine can take any amount of punishment and come back for more," says H. E. Williams, President, Little River Gravel Company, Temple, Texas. "We've been using Ford Trucks for 20 years. One reason is that Ford's got such a good reputation for long life that I can count on a higher price for my trucks come trade-in time."

The many advantages of a modern Short Stroke engine can be yours tomorrow, if you make your next truck a Ford. Only Ford puts Short Stroke design under the hood of *every* model, with a line of Short Stroke V-8's and a Short Stroke Six.

For up to 53% longer piston ring life, gas savings as great as 1 gallon in every 7, see your Ford Dealer right away!

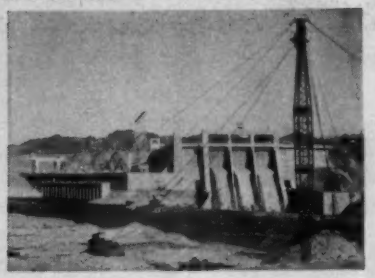
FORD TRIPLE ECONOMY TRUCKS

THE MONEY MAKERS FOR '55


The piston travels this far in a typical long stroke engine
LONG STROKE ENGINE
MODERN SHORT STROKE ENGINE
This much piston travel is saved . . .
when the piston travels only this far—as in a modern Ford Short Stroke engine

Differences between outdated long-stroke engines and Ford's modern Short Stroke design are far *greater* than they seem. In one case, Ford's stroke is shorter by 1¾ inches. But, in a year's driving of 11,000 miles this shorter stroke means *2,090 miles less piston travel per piston!* Think of the wear and friction you save right there!

"WALKING" CABLEWAY REMOVES 75,000 YDS. OF ROCK AT DAVIS DAM



To deepen the Colorado River from Davis Dam to 2,000 ft. downstream, Grafe-Callahan Construction Co., employed a Sauerman Slackline Cableway in this unusual arrangement:

Mast and hoist of the 2-cu. yd. machine were mounted on wooden mats. Only four "steps" were required in covering the 2,000-ft. distance as the excavation progressed. Maximum span was 600 ft. A crawler crane, running on a 30-ft. cofferdam on the opposite bank, served as tail anchor.

Total excavation was 75,000 yds. of rock. Excavation depth ranged from 10 to 15 ft. to provide the 20-ft. channel depth and lower tailwater at the power plant for maximum effective head on turbines.

Sauerman Slackline Cableways range from ⅓ to 3½ cu. yds. in size—span water, bogs or pits at distances up to 1,000 ft. On the ordinary or the unusual job, these Sauerman Cableways are unexcelled for deep digging or handling rock, sand, clay, peat and ore.

Experienced Sauerman Engineers can solve your excavating problems. Write today. Request Catalog C., "Slackline Cableways" and also pertinent field reports.

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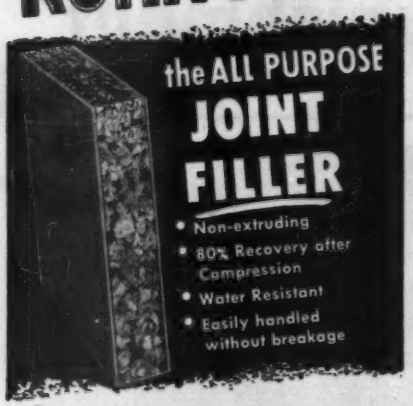

Composed of cork granules bonded together with asphalt between two sheets of heavy asphalt-saturated paper, KORK-PAK is the lowest cost, non-extruding joint filler on the market. KORK-PAK is readily handled without breakage . . . and when used in conjunction with Para-Plastic Joint Seal, always provides complete joint filling and protection.

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Here's vital information for ready reference on the new Tri-Forged steel grating and stair treads, plus latest information on Tri-Lok interlocked products. This fact-filled catalog gives you installation specifications, types of grating and stair treads available, and safe load tables. Be sure to write for your copy today.

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MEN AND JOBS

Men and Jobs Briefs . . .

• **Corps of Engineers**—In September, **Col. James U. Moorhead**, District Engineer in Portland, Ore., will be transferred to the Far East Command, with headquarters in Tokyo . . . **Lt. Col. R. Duncan Brown, Jr.** becomes executive officer in the Omaha, Neb., district office . . . **Glen C. Blegen** is appointed project engineer for The Dalles Dam.

• **Associations**—Traffic engineer **J. Edward Johnston** joins the Transportation and Communication Department of the Chamber of Commerce of the United States. He was with the Nebraska Highway Department for 12 years and was later with the American Automobile Association.

• **Careers**—The Cincinnati Metropolitan Housing Authority names **Harry L. Reece** director and secretary, succeeding the late **Ramsey Findlater** . . . **John A. Lambie** is appointed Los Angeles County Engineer, effective in Oct. . . . **L. E. Honeycutt** is named superintendent of public works at Thomasville, N. C. . . . **Frank K. Aona** becomes head of the Division of Sewers, Honolulu, T. H., succeeding **Franklin Y. K. Sunn**, new chief of the Bureau of Plans.

• **Business**—After serving for nearly 50 years with the New York State Department of Public Works, **Vibert L. Ostrander** will go to Egypt as consulting engineer with Charles N. Upham Associates Inc., Washington, D. C. . . . **Richard W. Black**, former head of the design and engineering division of Industrial Corporation, heads up the new Baltimore, Md., industrial division of Burns and Roe, Inc., New York engineers and constructors.

Herbert J. Scott is named construction specialist in the Chicago area for the Nelson Stud Welding Division of Gregory Industries, Inc. . . . **John H. Stevens** is promoted to senior architect at Libbey-Owens-Ford Glass Co.

• **Education**—**Carl E. Kindsvater**, hydraulics specialist, is named Regents' Professor of Civil Engineering at Georgia Institute of Technology where he has been a faculty member since 1945 . . . **Marion Farsman**, member of the General Electric research staff at Richland, Wash., is named assistant director of the Engineering and Industrial Experiment Station, University of Florida.

Before you plan your sewer system it will pay you to consider carefully all the advantages listed on this page. They are typical of those that Transite® Sewer Pipe has provided. Among them are real money-saving advantages important to all concerned with sewer systems . . . the contractor, the engineer, the taxpayer. And among them, in all likelihood, are many that Transite Pipe can put into effect *under your own sewer system conditions.*

Typical System Design Advantages

- Installed in shallower trenches
- Savings in amount of material excavated
- Smaller earth loads
- Elimination of cradling
- Location of treatment plant at higher level
- Elimination of pumping
- Use of smaller diameter pipe
- Installation at flatter slopes

Typical Installation Advantages

- Fewer joints
- Easier handling
- Smaller crews
- Speedier assembly
- Assurance that joints pass severe infiltration tests

Typical Operation Advantages

- Infiltration treatment cost drastically reduced
- Only normal sewage treated

Typical Maintenance Advantages

- Tree roots kept out—minimizes cleaning
- Sewers kept smooth and intact—pipe stays strong, joints stay resilient
- Need for frequent inspections reduced

For further information and your copy of TR-94A, helpful, widely used Sewer Design Flow Chart based on the Manning Formula, write Johns-Manville, Box 60, New York 16, New York

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Johns-Manville TRANSITE SEWER PIPE

the asbestos-cement sewer pipe for tighter systems

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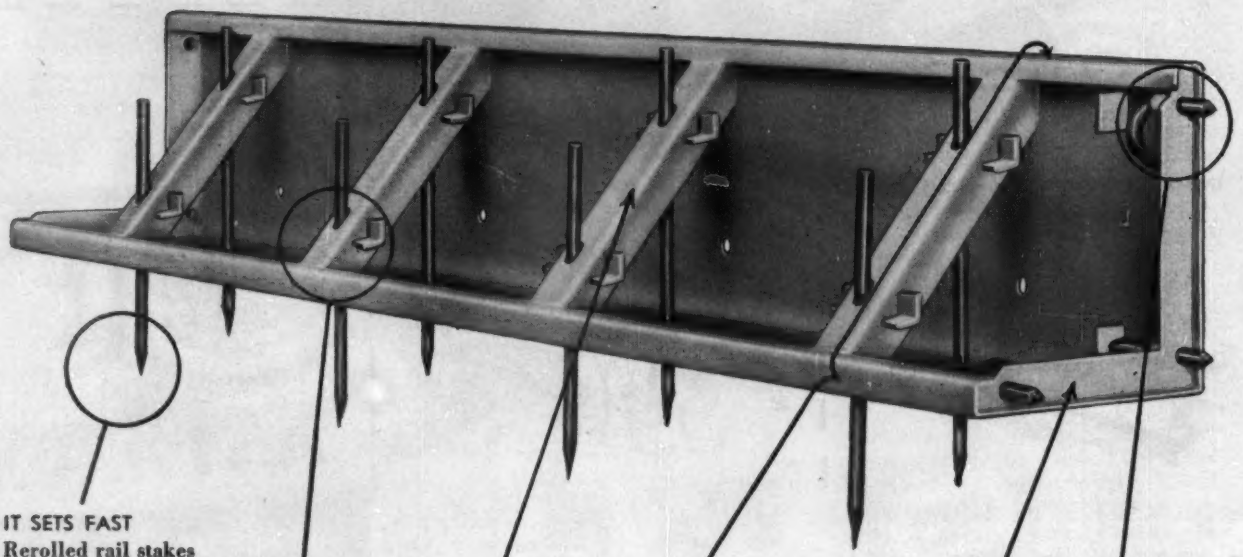
Designing around the suggestions of dozens of contractors we have developed a form superior in every way to anything on the market. Initial reports from several jobs in different sections of the nation bear out our contention—it is the best yet.



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Rerolled rail stakes with long points that will penetrate rock where necessary.

LOCKED-IN ANGLE WEDGES
Wedges of angle steel for greater strength. Upturned end retainers keep wedges in channel.

DOUBLE STRENGTH CHANNEL SECTIONS
Not just stake pockets, but real points of support. By using channel sections form strength is doubled.

EXTRA WIDE TRACK
Full track with generous flange securely welded to channel sections.

FULL SUPPORT ON EACH END
L-section at each end of form keeps face and base at true right angle, also supports tread —prevents form damage where it most often occurs.

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Pointed dowels at *all three corners* quickly give form setter perfect alignment. It can't fail!

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Two handy form booklets from which you will be able to select the exact form for any job need. Write today for your copies of K-19 and L-20.

★ Where specifications demand face and base of equal dimensions, Heltzel can furnish single purpose forms of same basic design.

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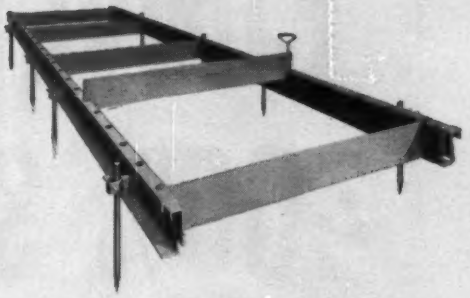
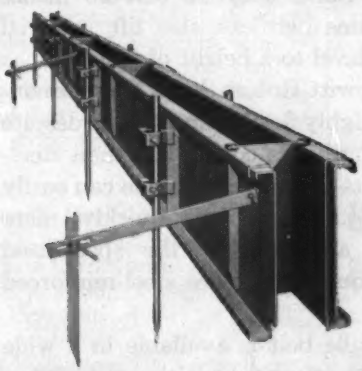


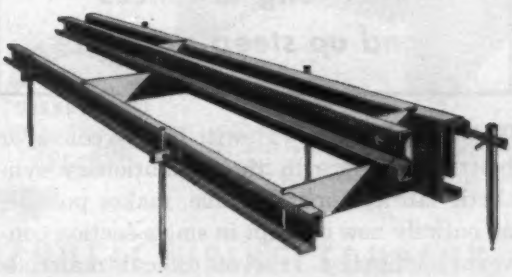
The favorites of more contractors than any sidewalk form. Sturdy, built for years of wear—they go down fast and strip easy. Rerolled rail stakes with adjustable wedge pockets.

CURB FORMS



A complete line of curb forms for every style and size. Give us your job dimensions and we'll suggest the form to suit exact requirements.

CURB AND GUTTER FORMS



Here's the finest curb and gutter form made today. A single base set of Helco curb and gutter forms can be made to conform to just about any curb and gutter style known. The one real all-purpose unit.

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STEEL FORMS

NEW SUPER RAYNILE CONVEYOR BELT 400% STRONGER

Provides the economical answer to transporting crushed stone and other bulk materials over long distances and up steep slopes.

This remarkable new Hewitt-Robins conveyor belt reinforced with the revolutionary synthetic fabric, Super Raynile, makes possible an entirely new concept in single-section conveyor application. It solves difficult materials handling problems where topography and other conditions require the use of a long single-length conveyor.

Already in service, Super Raynile has the highest operating tension of any conventional carcass belt. Because of its tremendous tensile strength, 400% greater than conventional cotton reinforced belts, a single conveyor section *5¾ miles long* can be built over level terrain to carry material at 400 TPH using only a 6-ply Super Raynile belt 30 inches wide. This same belt can also lift material from ground level to a height of 830 feet.

The new Hewitt-Robins Super Raynile conveyor belt is highly flexible and pliable despite its great strength. Its cost is less than steel-reinforced belts and Super Raynile can easily be spliced in the field more quickly, more economically and without the specialized equipment required to splice steel-reinforced belts.

Super Raynile belt is available in a wide range of specifications . . . widths up to 72"—thickness up to 15 plies.

Learn more about this new long-length, long-life conveyor belt. Contact your local Hewitt-Robins Industrial Supply Distributor (see Classified Phone Book), or write direct to "Super Raynile Belt", Hewitt-Robins Incorporated, Stamford, Connecticut.

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Conveyor Belting—Industrial Hose—Conveyor Machinery—Vibrating Screens—Vibrating Conveyors—Design, Manufacture, Engineering and Erection of Complete Bulk Materials Handling Systems.

HEWITT-ROBINS INCORPORATED • STAMFORD, CONNECTICUT

OBITUARIES

Harmon S. Meissner, 55, authority on cement and concrete for the Bureau of Reclamation at Denver, died July 22. During his 25 years with the Bureau he made contributions to development of equipment and procedures for testing cement, concrete, paint and other construction materials. He devised methods for testing thermal properties of concrete and for measuring heat generated by hydrating cement in massive concrete structures, which assisted in development of a low-heat cement used in Hoover and other large concrete dams. He served with the bureau as head of the Structural Properties of Concrete and Foundation Section, in the Division of Engineering Laboratories.

Robert L. Tilley, 57, city engineer of Belmont, Calif., for the past year, died July 12. Before taking the post with the San Francisco Peninsula community he was chief engineer of Wilsey & Ham, Burlington, Calif., construction firm. At the time of his death he was district engineer and general manager of the North Coast County Water District, with headquarters in Sharp Park, Calif.

William B. Hoag, 79, retired San Francisco civil engineer, died July 18 in Santa Barbara, Calif. Working with Lyon & Hoag, San Francisco real estate firm, he planned the California communities of Aptos, Rio del Mar and Los Altos, in addition to several residential districts in San Francisco.

Dr. Henry S. Jacoby, 98, of Washington, D. C., a bridge engineer, died August 1, in Quakertown, Pa. He was a former professor of engineering at Cornell University.

Thomas Wilkinson, 70, a retired construction engineer, died August 1, in New York City. Before retirement two years ago he was employed in the construction division of the New York Board of Transportation.

James A. Daley, 66, a civil engineer since 1946 for the New York State Public Works Department in Buffalo, died July 21. He had been associated with the Municipal Grade Crossing and Terminal Station Commission as an engineer.

Albert N. Lowery, 53, an engineer with the city of Winston-Salem, N. C., for the past four years, died July 16.

In Shipbuilding as in other great industries
MILLER WELDERS are preferred

St. Louis Shipbuilding and Steel Co., largest builders of inland towboats in the world, require welds that will withstand a maximum amount of abuse.

Look anywhere in St. Louis Shipbuilding's mammoth yard and you will see Miller Selenium Rectifier type D.C. arc welders—in single units or in batteries of four and five for greater output.

For dependable welds, St. Louis Shipbuilding prefers the Miller S.R. welder. Miller is glad to be aboard.

ARC SPOT miller GENERATORS WELDERS

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

Conn., Norwalk—SCHOOL—BA 8/23—City Bd. Educ., c/o Supt. Schools, Norwalk, Springwood Elementary School. $692,250. Plans deposit $40. Gilroy & Gaydosh, 64 Wall St., archts. CD 3/3.

HEAVY CONSTRUCTION—LB & CA

▲† Morrison-Knudsen Co. and Landers & Griffin, 800 Islington St., Portsmouth, N. H., CA $1,072,911. est. $1,000,000. storage facilities for ordnance storage area, Portsmouth Air Force Base, ENG 19-016-56-6. PORTSMOUTH, N. H. U. S. Eng., 857 Commonwealth Ave., Boston 15, Mass. Bids July 26. CD 7/29, under LB.

▲† The Ferber Co., 16 Johnson Ave., Hackensack, N. J. CA $1,610,495. est. $800,000-$900,000. special AAA facilities, Netacom Ave. and Ferry Rd. etc., Bristol and Coventry, ENG 19-016-55-165. RHODE ISLAND. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids July 12. CD 7/15, under LB.

BUILDINGS—LB & CA

▲ H. P. Cummings Constr. Co., Ware, Mass., LB $1,343,333. womens' DORMITORY, BURLINGTON, VT. University of Vermont and State Agricultural College, Burlington, Vt. Bids Aug. 13. CD 7/20.

▲ Jefferson Constr. Co., 75 First St., Cambridge, Mass. LB $1,607,000. regional high SCHOOL, DENNIS, MASS. Dennis-Yarmouth School Dist., Wallace Liberty, West Yarmouth, Mass. Bids Aug. 2. CD 7/1.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ D. C., Wash.—OFFICE ADDN.—BA 8/23—National Rifle Assn. of America, 1601 Rhode Island Ave., N.W., selected list of bidders, office addn. Plans deposit $20. A. R. Clas, Wyatt Bldg., archt. CD 2/24.

▲ N. Y., New York—LIBRARY—BA 9/20—Bd. Higher Educ., the City College Business Office, Brett Hall, 136 St. and Convent Ave., Zone 31, Contr. No. 1 general constr.; Contr. No. 2 plumbing work; Contr. No. 3 heating and ventilating work; Contr. No. 4 electrical work for library of City College, South Campus (Manhattanville). $3,000,000. Plans deposit $60. Contr. No. 1; $40, contr. No. 2; $30 Contr. No. 3, $40, Contr. No. 4, all refundable. CD 3/30.

HEAVY CONSTRUCTION—LB & CA

▲ Morrison-Knudsen Co., Inc., 319 Broadway Ave., Boise, Idaho, B. Perini & Sons, Inc., 73 Montwaite Ave., Framingham, Mass., Walsh Constr. Co., 122 E. 42 St., New York, N. Y., Utah Constr. Co., 144 E. Broadway, Salt Lake City, Utah, CA $7,824,133. (concrete and portland cement) (5 bidders) Massena intake near Massena, St. Lawrence Co., New York, Spec. No. PA-5-11004, St. Lawrence Contr. No. 16, NEW YORK. Power Authority of the State of New York, 270 Broadway, New York 7, N. Y. CD 8/4, under LB.

Nance & Vivadelli, Arlington Trust Bldg., Arlington, Va., CA $726,461, Anacostia force main and gravity sewer, Section III, Kenilworth Ave. between 42 St. and Blaine St. N.E. WASH. D. C. D. C. Govt., Dpt. Sanitary Eng., 499 Pa. Ave. N.W., Wash., D. C. Bids May 19, awarded July 14. CD 5/26, under LB.

BUILDINGS—LB & CA

▲ Melba Park Homes, c/o Sterling Palm, archt., 89-51 164 St., Jamaica 3, N. Y., Owner Builds, $1,000,000. 61 HOUSES on tract on North Middletown Rd. north of Rte. 59, NANUET, N. Y.

Thomas Schmidt, c/o George E. Wilms & Co., 13-47 River Rd., Fairlawn, N. J. Owner Builds, $700,000. 46 HOUSES on tract on Grove St., OAKLAND, N. J.

SOUTH

BUILDINGS—BA

▲ La., Lafayette—ENGINEERING—BA 9/13—State Bldg. Auth., State Capitol, Baton Rouge, 2 story, masonry, steel frame engineering bldg., Southwestern Louisiana Institute, Proj. No. E 3 SLI-1, $1,500,000. Plans deposit $50. Charles R. Colbert, Herbert A. Benson & Assoc., 1048 National Bank Bldg., New Orleans, archts. CD 4/22/48.

BUILDINGS—LB & CA

Cherokee Constr. Co., 23 Second Ave., Cleveland, Tenn. CA $778,443, six SCHOOL projects, Gordon Co. CALHOUN, GA. State School Bldg. Auth., 41 Exchange Pl., S. E., Atlanta, Ga. Bids June 28. CD 7/8, under LB.

Robert Thibodeaux & Co., Box 887, Baton Rouge, La. LB $364,000. (6 bidders) veterinary RESEARCH CENTER, BATON ROUGE, LA. State University, Geo. W. Schwab, Purch. Agent, Baton Rouge, La. J. H. Farrens, 1055 Convention St., Baton Rouge, La., archt.

▲ J. C. McClendon Jr., Box 21, Gulfport, Miss. CA $1,020,000. two three-story men's RESIDENCE HALLS LAFAYETTE, LA. State Bd. Educ., State Capitol, Baton Rouge, La. Bids July 28, awarded Aug. 1. CD 8/4, under LB.

Barksdale & LeBlanc, Box 1567, Baton Rouge, La. CA $630,750. 3 story rein.-con. frame STUDENT UNION bldg. at Southwestern Institute, LAFAYETTE, LA. State Bd. Educ., State Capitol, Baton Rouge, La. Bids July 28, awarded Aug. 1. CD 8/4, under LB.

▲ Hogan Bros., Inc., 236 Focis St., Metairie, La. CA $1,032,231. 2 story, steel frame, masonry STORE in Gentilly Woods, NEW ORLEANS, LA. Sears Roebuck & Co., Baronne and Common Sts., New Orleans, La. Bids July 21, awarded Aug. 5. CD 8/2, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ O., Elyria—BA 8/30—City, M. J. Lotko, Safety Service Dir., City Hall, storm water sewer in Dist. L, inclusive of rein.-con. headwalls, junction chambers 14,928 lin. ft. 24-to 120-in. sewers, 140 lin. ft. 120-in. sewer in tunnel, other related work, $1,000,000. Plans deposit $40. Havens & Emerson, 640 Leader Bldg., Cleveland, Zone 14, engrs.

▲ Ind., Indianapolis—BA 9/8—Bd. Sanitary Comrs., 421 N. Pennsylvania St., Contr. No. 55-S-26-MH sludge incinerator bldg. and auxiliaries, Total est. $2,000,000. Plans deposit $100. Moore & Heger, 810 N. New Jersey St., Indianapolis, engrs. CD 5/5/53.

▲ Mich., Dearborn—BA 9/20—Dearborn-Melvindale Disposal Auth., Dale H. Fillmore, chn., Dpt. Law, City Hall, Dearborn, refuse incinerator. Plans deposit $100. Metcaff & Eddy, 1300 Statler Bldg., Boston, Mass., engrs. CD 7/21.

HEAVY CONSTRUCTION—LB & CA

WISCONSIN—State Hy. Comn., State Office Bldg., Madison,

L. G. Arnold, Inc., 2014 N. Dewey St., Eau Claire, Wis., LB $520,785. (5 bidders) Contr. 1, structure and approaches, 0.554 mi. City Street, The Henry Avenue B Bridge and approaches (City of Beloit), Proj. T 0-0 (2) Rock Co. Bids Aug. 2. CD 7/15.

Geo. W. Kukurin Co., McKeesport, Pa. CA $418,582. est. $525,000. addns. to water sys., SHEFFIELD, O. Village, Sheffield, O. Awarded Aug. 2.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

BUILDINGS—LB & CA

Frank Messer & Sons, Inc., Paddock Rd., Cincinnati, O. CA Total Est. $500,000. 2 story bsmnt., brick, steel, rein.-con. HOSPITAL addn., CINCINNATI, O. Hospital Care Corp., Woodburn and Wm Howard Taft Rd., Cincinnati, O. Elliston-Hail-McAllister & Stockwell, 706 Walnut St., Cincinnati, O., archts. Awarded Aug. 2. CD 10/25/54.

▲ H. C. Huber Constr. Co., W. Stroop and Waterbury Dr., Dayton, O. Owner Builds, $3,300,000. 280 HOMES on 70 acre site on west side of Lamme Rd., DAYTON, O.

Steward Constr. Co., Marion, O. CA Est. $500,000. 38,000 sq. ft. brick, concrete, steel SERVICE Bldg., MARION, O. Ohio Edison Co., Marion, O.

▲ Forecast Constr. Co., Sanford Collins, pres., 310 Tiffin St., Sandusky, O. Own Forces, $2,000,000. 130 HOMES on Farmer Farm land near Venice on Rtes. 2 and 6, SANDUSKY, O.

▲ Huber, Hunt & Nichols, Inc., 2450 S. Tibbs Ave., Indianapolis, Ind., CA est. $2,000,000. 1,750,000 sq. ft. STAMPING PLANT, MARION, IND. General Motors Corp., Fisher Body Div., General Motors Bldg., Detroit, Mich. CD 7/26 under CA.

▲ Green Constr. Co. Oaktown, Ind., CA, Total Est. $45,000,000. site grading, railroad tracks incl. 300,000 kw power plant coal generator, electric POWER PLANT near NEW ALBANY, IND. Public Service Co. of Indiana, 1000 E. Main St., Plainfield, Ind. Bids July 8. CD 11/9/53.

J. P. Larson, 6906 Sheridan Rd., Kenosha, Wis. LB $496,215, 185x263 ft. Sunnyside Grade SCHOOL, KENOSHA, WIS. Bd. Educ., 5515 Sheridan Rd. Kenosha, Wis. Bids July 18. CD 6/29.

▲ Fuller Constr. Co., 5500 W. Capitol St., Milwaukee, Wis. LB $1,568,000 (2 bidders) general contract, department STORE at Shuster's Capitol Court Proj. MILWAUKEE, WIS. T. A. Chapman Co., 407 E. Wisconsin Ave., Milwaukee 2, Wis. Bids Aug. 3. CD 7/28;
Downey Heating Co., 1739 W. St. Paul Ave., Milwaukee, Wis., LB $442,900. heating contract. (Milwaukee, Wis.).

J. Algaier & Son, Inc. 6509 W. Moltke Ave., Milwaukee, Wis., CA est. $100,000. 1 story 102x120 ft. part bsmnt. FACTORY, MILWAUKEE, WIS. Henri Food Products, 233 E. Keefe Ave., Milwaukee, Wis. Bids July 18. CD 7/7.

▲ C. H. Reisdorf & Son, 9353 Freeland St., Detroit, Mich. CA $1,244,947. general contract, 3 story, STATE HALL and penthouse addn., Wayne University, DETROIT, MICH. City, Bd. Educ., 1354 Broadway, Detroit, Mich. CD 7/27, under LB.

▲ Harry Slatkin Builders, Inc., 11534 Dexter St., Detroit, Mich. Owner Builds, $4,000,000. 359 HOMES north of 13 Mile Rd., MADISON HEIGHTS, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† Okla., Altus—STORM DRAINAGE—BA 8/24—U. S. Eng., Box 61, Tulsa Zone 2, storm drainage sys., Altus Air Force Base, Inv. ENG-34-066-56-5. $1,350,000.

BUILDINGS—BA

Mont., Bozeman—SCHOOL—BA 9/8—Gallatin County High School Distr., W. Main St., 1 story, 360x580 ft. high school, $900,000, Fred F. Willson, 21 W. Babcock St., and Oswald Berg Jr., 24 W. Main St., archts. CD 6/14.

▲ Tex., Tyler—SHOPPING CENTER—Bids Asked—A. Dennin & W. B. Curtis, Tyler, shopping center, $1,250,000. Carl Gregory, Box 763, Tyler, archt. CD 7/25.

HEAVY CONSTRUCTION—LB & CA

▲ MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul, rejected bids July 15, grade, grav. base 6.8 mi. between 0.8 mi. south of Minnesota City and Mankato Ave. in Winona, Winona Co. LB $1,226,250. CD 7/21, under LB.

J. W. Craig Co., 1814 California St. N.E., Minneapolis, Minn. LB $76,814. (3 bidders) bit. stabilized base bit. seal coat 3.3 mi., 3 mi. and 4.2 mi., ANOKA, MINN. Anoka Co., K. W. Campbell, aud., Anoka, Minn. Bids Aug. 2. CD 7/15.

Bain, Roberts & Bain, Clarissa, Minn. LB $78,571. (6 bidders) grade, grav. surf. 5.4 mi. near Browerville and 2.9 mi. near Staples, LONG PRAIRIE, MINN. Todd Co., Nick Truog, aud., Long Prairie, Minn. Bids Aug. 1. CD 7/15.

† Markham-Brown Constr. Co., 1961 N. Industrial Blvd., Dallas, Tex. LB $294,469. est. $315,425. constr. repair approx. 11,100 lin. ft. pile dike and revetment Burlington Bend to Isbell Reach, River mile 154.4 to 129.0, Jefferson City, Spec. 56-3, MISSOURI. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Aug. 2. CD 7/15.

(Continued on pg. 80)

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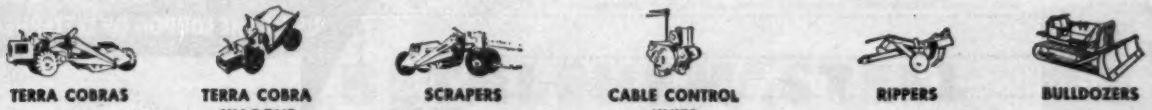

TERRA COBRAS | TERRA COBRA WAGONS | SCRAPERS | CABLE CONTROL UNITS | RIPPERS | BULLDOZERS

(Continued from pg. 78)

▲ **Missouri Public Service Co.**, Richard C. Green, exec. vice-pres., Warrensburg, Mo. Own Forces, Est. $2,540,176. various addns., replacements of urban and rural electric, gas and water facilities substations, installation switchgear, transformers, at various parts of system; Est. $173,000. Proj. 24 Schedule E-3, 69 KV transmission line and substation at Appleton City to provide addnl. capacity to area; Est. $120,000. exten. constr. distr. sys. to serve 400 new homes at Sedalia Air Force Base, Knobnoster; Est. $80,000. install 2 low lift 9,000 6 PM pumps, earth levee settling basin, drill deep well and install deep well pump and remodel bldg. at Ralph Green Plant to provide offices, employees locker and wash rooms, tool room, switchboard enclosure, Pleasant Hill; Est. $102,000. convert East Commercial St. 2,400 volt circuit to 12 KV, substation and meter shop, Sedalia; Est. $610,872. natural gas transmission laterals, distr. lines, Platte Co.; Est. $660,000. Proj. 14, Schedule E-3, 19.2 mi. of 69 KV transmission line, associated substations to serve Kansas City Mid-Continent Airport and T.W.A. overhaul base in Platte Co.; Est. $168,300. Install 500 KVA 12/4.16 substation, 5 mi. 1-phase and 12 mi. 3-phase 12 KV line, etc. at Richards, Deerfield and Nevada, Mo., overhead ground wire and wood braces on 69 KV line, Warrensburg to Pleasant Hill, and 12 KV line and substation in Sedalia; Est. $173,600. 2.4 mi. 69 KV line Liberty to near Claycomo; overhead ground wire and wood braces on Warrensburg to Clinton transmission line; convert Chillicothe to Trenton 35 KV line to 69 KV and substation, MISSOURI. Grand total $4,627,948. CD 6/9/52.

Natkin & Co., 1924 Oak St., Kansas City, Mo. CA $546,161. cooling water conservation sys., WICHITA, KAN. Boeing Airplane Co., Personnel Bldg., Wichita, Kan. Bids July 28. CD 7/11.

Peter Kiewit Sons Co., P. O. Box 8787, University Park Sta., Denver, Colo., CA, $518,042. 18 mi. of streets and curbs, gutter work, AURORA, COLO. Town, Court House, Aurora, Colo. Awarded July 25.

BUILDINGS—LB & CA

Henry Carlson Co., 416 S. 2 St., Sioux Falls, S. D. LB $537,304. (6 bidders) general contract, high SCHOOL, FULDA, MINN. Bd. Educ., J. P. Tuseth, clk., Fulda, Minn. Bids Aug. 3. CD 7/13.

Siteman-Adreon Inc., Builders, 7603 Forsyth Blvd., Clayton 24, Mo. Owner Builds, $500,000. 70 RESIDENCES on 1 acre tract each in Frontenac Forest Subdivision on Bopp Rd. south of Clayton Rds., FRONTENAC (ST. LOUIS 24, P. O.), MO. Robert G. McMahon, 8147 Delmar Blvd., University City 24, Mo., archt.

John Larson, Bismarck, N. D., LB $506,000 (7 bidders) 2-story 196x262 ft. girls' DORMITORY, JAMESTOWN, N. D. Jamestown College, Dr. E. H. Rian, pres., Jamestown, N. D. Bids Aug. 3. CD 7/20.

▲ **Stearns-Roger Mfg. Co.**, 660 Bannock St., Denver, Colo., CA $5,000,000. design and construct cement PLANT ADDN., BOETTCHER, COLO. Ideal Portland Cement Co., Denver National Bldg., Denver, Colo.

† **Mountain States Constr. Co.**, Denham Bldg., Denver, Colo., LB, $694,427, est. $900,000. 19,000 sq. ft. industrial type bldg., at atomic POWER PLANT EXPANSION, DENVER, COLO. U. S. Atomic Energy Comn., P. O. Box 2611, Rocky Flats Plant, Denver, Colo. Bids July 26. CD 7/1.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

† **Richards & Assocs.**, Carrollton, Ga., CA $606,302 est. $590,691, Palisades-Goshen 115 kilovolt transmission lines, Bingham Co., IDAHO Bureau Reclamation, Dpt. Interior, Palisades, Idaho. Bids June 23, awarded Aug. 3. CD 7/5, under LB.

ARIZONA—State Hy. Dpt., 17th Ave. and Jackson St., Phoenix,

Heiser & Garnett Constr. Co., 731 N. 19th Ave., Phoenix, Ariz., CA $138,476, grading, draining, road fdn., bit. surf. 4.25 mi. St. Hy. 95, 15 mi. northeast of Yuma, Yuma Co. Bids July 22, awarded Aug. 1. CD 7/15.

BUILDINGS—LB & CA

Peterson Homes, Mountlake Terrace, Wash. Day Labor. $565,000. 51 HOMES in Plot 42, MOUNTLAKE TERRACE, WASH.

▲ **The Fieldstone Co.**, 9838 E. Belmont St., Bellflower, Calif. Owner Builds, $3,119,106, 264 frame, stucco DWELLINGS, in Tract 2137, BUENA PARK, CALIF.

Holdener Constr. Co., 2608 R St., Sacramento, Calif. LB $875,766. (4 bidders) McClellan Junior HIGH SCHOOL addns., North Highlands, DEL PASO HEIGHTS, CALIF. Grant Union High School Dist., Grand Ave., Del Paso Heights, Calif. CD 12/27/54.

▲ **Downey Union High School Dist.**, Downey, Calif., rejected bids June 28, 89,955 sq. ft. Earl Warren High SCHOOL, DOWNEY, CALIF., LB $1,524,038. New bids August 9. CD 7/6, under LB.

▲ **Zaballos Brothers**, 850 Soto St., Hayward, Calif., CA $2,093,750, Castro Valley High SCHOOL, Castro Valley, HAYWARD, CALIF. Hayward Union Elementary School Dist., 22300 Foothill Blvd., Hayward, Calif. Bids July 13, awarded Aug. 5. CD 7/20, under LB.

Beckner Constr. Co., 2650 River Ave., South San Gabriel, Calif., LB $834,782. est. $650,000. Wilson HIGH SCHOOL ADDNS., LOS ANGELES, CALIF. Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Aug. 4. CD 7/20.

CANADA

BUILDINGS—BA

▲ **Que., St. Hubert** — HOUSING — BA 9/1 — Central Mortgage & Housing Corp., 940 Cote de Liesse Rd., Town of Mount Royal, Montreal, 200 housing units at St. Hubert Air Base. $1,250,000. M. P. McAndrew, Regional Constr. Supt., c/o owner, engr.

▲ **Ont., Sudbury**—HIGH SCHOOL—BA 8/24—Nickel District Collegiate Institution Board, 12 Stewart Dr., high school, $1,340,000. Allward & Guinlock, 57 Bloor St. W., Toronto, archts. R. P. Allsop & Assocs., 290 Davenport Rd., Toronto, engrs. CD 1/4.

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,

Poole Engrg. Co. Ltd., & Raymond International Co. Ltd., 1104 Hornby St., Vancouver, B. C., CA $2,053,891, bridge over west arm of Kootenay Lake at Nelson, B. C. 1,100 ft. cantilever structure with main opening of 485 ft. and side spans of 305 ft. Bids July 6, awarded July 26. CD 7/18, under LB.

BRITISH COLUMBIA—B. C. Govt., Parliament Bldgs., Victoria,

Highway Constr. Co. Ltd., 789 W. Pender St., Vancouver B. C., LB $597,735, road constr., Salkel Flats-Nine Mile Creek Sect. of Trans-Canada Hy. Bids July 14.

Dominion Bridge Co. Ltd., 2450 Boundary Rd., Vancouver, B. C., CA $154,081, supplying 6,800 ft. 48-in. steel water pipe; CA $256,307. 5,300 ft. 72-in. and 600 ft. 63-in. steel water main pipe; CA $317,234, supply approx. 176,000 ft. 42-in. steel water pipe, Grand total $727,622, VANCOUVER, B. C. Greater Vancouver Water Dist., 500 Beatty St., Vancouver, B. C. Awarded July 24.

▲ **Swansea Constr. Co. Ltd.**, 363 Rogers Rd., Toronto, Ont., CA $1,017,396, six tunnel sects., one settling tank, approx. 59,700 lin. ft. 12- to 60-in. sewers, at Stamford, NIAGARA FALLS, ONT. Stamford Twp., 1810 Ferry St., Niagara Falls, Ont., M. F. Ker, c/o owner, engr. Awarded Aug. 3.

Continental Constr. Co., Regina, Sask., CA $429,423. earth-fill dam 65 ft. high; 112 ft. x 212 ft. rein.-con. chute type spillway, Gravelbourg-LaFleche area, REGINA, SASK. Prarie Farm Rehabilitation Act, Regina, Sask. Awarded July 26. CD 12/31/52.

BUILDINGS—LB & CA

Beaver Constr. Co. Ltd., 175 W. 5th Ave., Vancouver, B. C., CA $742,190. SCHOOL and recreational unit at Deaf and Blind School, W. 4 Ave., VANCOUVER, B. C. B. C. Govt., Parliament Bldg., Victoria, B. C. Bids July 20, awarded July 28. CD 7/29, under LB.

(Continued on pg. 82)

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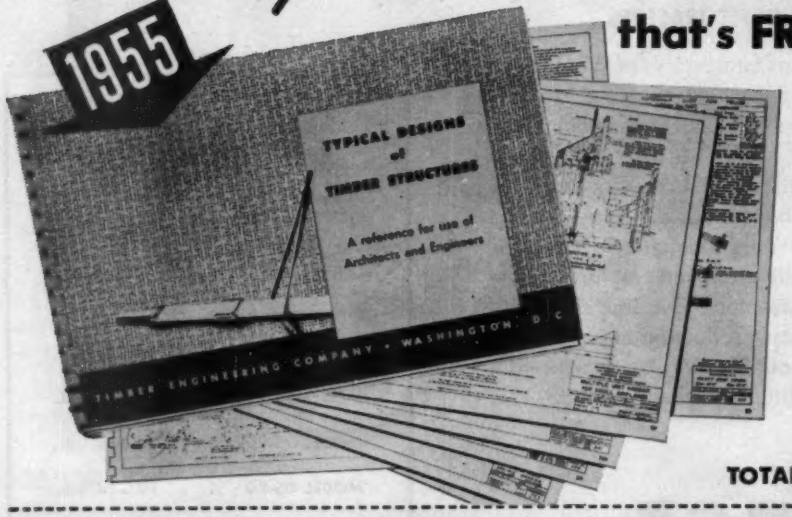
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Bethlehem Steel Pipe in the Bay State

WORCESTER—Early in March work began on a major water supply project requiring 14,300 ft of 36- and 5900 ft of 30-in. ID Bethlehem Pipe—coal-tar enameled, and wrapped both with felt and paper. Contractor is Johnson Brothers; design engineer is Metcalf & Eddy.

BOSTON—Coleman Brothers Corp. laid this line of 60-in. ID tar-enameled and wrapped Bethlehem Pipe along the Charles River. The bridge leads to Harvard University. This job, as well as the two shown below, is a project of Boston's Metropolitan District Commission.

EAST MILTON—Southeast of metropolitan Boston, Marinucci Brothers and Co., Inc., is installing 24-in. Bethlehem Pipe. The twin lines shown here bridge the Southeast Expressway, a high-speed artery now under construction.

DEDHAM—These 40-ft lengths of Bethlehem Pipe, 36 in. ID, are part of an 11,500-ft line between Dedham and West Roxbury, southwest of Boston. Chesterbrook Construction Co. is handling installation of the project.

Bethlehem Steel Pipe for water and sewage transmission is available in 40-ft lengths, coated, lined and wrapped, in all diameters from 18 in. to the largest permitted by common carriers. For further information, we suggest you contact the Bethlehem sales office nearest you:

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

(Continued from pg. 80)

Mollenhauer Contrg. Co. Ltd., 186 Perth Ave., Toronto, Ont., LB $315,000 (8 bidders) 1 story 122x303 ft., steel frame, brick PLANT addn., incl. radial brick chimney and boiler room exten. HOLLAND LANDING, ONT. Office Specialty Mfg. Co., 97 Wellington St., Toronto, Ont. Bids July 27. CD 7/22.

Cadillac Contrg. & Developments Ltd., 366 Adelaide St. W., Toronto, Ont. Owner Builds. $600,000. 8-story 45x142 ft. rein.-con. fdn., structural steel frame, brick and block APARTMENT, inside parking area. TORONTO, ONT. Venchiarutti & Venchiarutti, 2941 Bathurst St., Toronto, Ont. archts.

▲ **J. P. Morin, Ltd.**, 528 Notre Dame St., Cap de la Madeleine, Que., CA est. $1,500,000. 4-story main sect., 209 ft. frontage; 6-story 75x107 ft. rear wing; power plant; sisters and nurses residences, 100-bed capacity HOSPITAL, LASARRE, QUE. St. Francis Hospital, LaSarre, Que. Jean Charles Fortin, 240 4th Ave., Val d'Or, Que., archt.

▲ **Louis B. Magil Co.**, 5275 Queen Mary Rd., Montreal, Que. Owner Builds, est. $1,000,000. 72-unit HOUSING program in suburban Pointe Claire, MONTREAL, QUE.

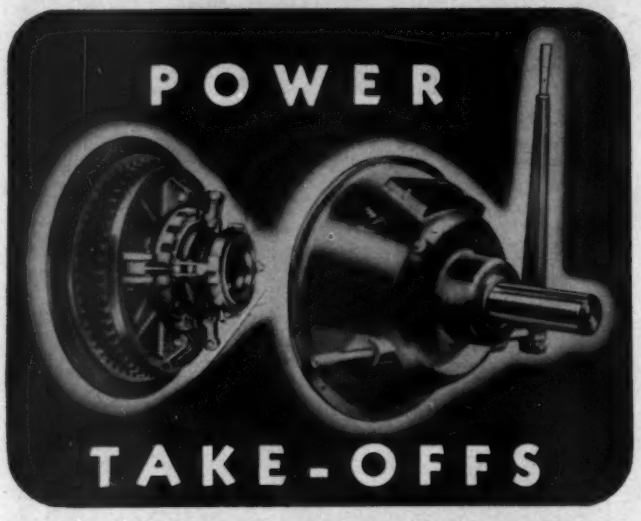
▲ **Lummus Co. of Canada, Ltd.**, 455 Craig St., Montreal, Que., CA est. $9,000,000. Design and Construct, 155 ton daily capacity AMMONIA PLANT, VARENNES, QUE. Quebec Ammonia Co. Ltd., 660 St. Catherine St. W., Montreal, Que.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Cuba**—BA 9/15—Primera Central Hidroelectrica Cubana, hereinafter referred to as PRICHEC at Edificio de la Lonja del Commercio, Sexto Piso, Havana, underground excavation contract is one of several constr. contracts expected for completion of the Hanabanilla Proj. a hydroelectric dam and power plant development at the Hanabanilla River, approx. 50 kilometers east of Cienfuegos. Incl. (a) excavation for intake channel, intake tower, penstock shaft, service tunnel, powerhouse valve chamber and tailrace tunnel 6.7 kilometers long; (b) const. rein.-con. lining for service tunnel, powerhouse cavern and valve chamber roofs and railrace tunnel as required; (c) consolidation and contract grouting required for a. and b.; (d) disposal of excavated materials; (e) care of water during constr.; (f) structural steel roof supports, steel roof bolts and dry packing. Approx. 75,000 cu. meters of open cut excavation, 150,000 cu. meters of underground excavation and 20,000 cu. meters of concrete. Plans deposit $25. Bidders are also required to send a sealed copy of the bid on Sept. 15 to Knappen-Tippetts-Abbett-McCarthy, Engineers, hereinafter referred to as the Engineer, 62 W. 47 St., New York 36, N. Y. U. S. A. adv ENR 8/4.

ROCKFORD



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WIDE RANGE OF SIZES
CONSERVATIVE RATING
ROLLER BEARINGS
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S.A.E. DIMENSIONS

*ROCKFORD POWER TAKE-OFFS are designed for generous overload capacity, when the standard length shaft is used and the center of the load is placed at a point half way along the shaft extension. The proportions of the shaft and bearings are determined by the load capacity of the clutch selected.

Send for This Handy Bulletin

Shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications.

ROCKFORD CLUTCH DIVISION BORG-WARNER
▲ 313 Catherine Street, Rockford, Illinois, U.S.A. ▲

CLUTCHES

PROPOSED PROJECTS

▲ **Calif., San Diego**—Valley Center Municipal Water Dist., San Diego, $1,600,000 bond election August 30, water distr. sys.

▲ **Okla., Duncan**—City, bond election Sept. 13, reservoir water supply. $1,800,000. Hudgins, Thompson & Ball, 1411 Clarsen St., Oklahoma City, consult. engrs. CD 2/16.

▲ **Wis., Milwaukee**—City, water main extens. in various parts of the city, $1,000,000. Lloyd D. Knapp, city engr.

▲ **Que., Beaconsfield**—Town of Beaconfield, P. Q. Beaurepaire, water lines and sewer connections to Pointe Claire planned filtration and disposal plants. $3,000,000. H. W. Lea, 1226 University St., Montreal, consult. engr. CD 6/24/53.

BRIDGES

▲ **Ala., Birmingham**—City, Dpt. P. Imprv., City Hall, three railroad underpass, at 1st Ave. and 47th St. N., $500,000; 26th St. and 27th Ave. N., $500,000 and at 34th St. around Avenue A, Ensley Area. $500,000. A. L. McWhorter, city engr. CD 4/30/52.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Houghton Co.—rein.-con., steel bridge over Keeweenaw Waterway between Hancock and Houghton, replace old span, $5,100,000. George M. Foster, comr.

STREETS AND ROADS

▲ **ALABAMA**—State Hy. Comn., Montgomery,

Calhoun and Etowah Counties—22 mi. road from Anniston to Gadsden, $2,000,000.

▲ **Ala., Mobile**—City, City Hall, street imprvs. in Touiminville area, $2,000,000. Palmer & Baker, Inc., 959 Spring Hill Ave., engr. CD 6/6.

▲ **ARKANSAS**—State Hy. Dpt., State Capitol, Little Rock,

Clay and Randolph Counties—rebuilding and relocation 16 mi. U. S. Hy. 67, Corning-Current River, $1,500,000.

Drew Co.—alternate by-pass around city St. Hy. 81, Monticello, $325,000.

Jefferson Co.—widening 5.5 mi. U. S. Hy. 65, Pine Bluff, $220,000.

Phillips Co.—extend St. Hy. 20 to connect U. S. Hys. 70 and 79 with planned new bridge over Mississippi River at Helena.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany,

Westchester Co.—reconstr. of 8 mi. of Albany Post Rd. from Croton River north to Peekskill, $7,500,000.

† **Missouri and Arkansas**—U. S. Eng., P. O. Box 867, Little Rock, Ark., plans by Sverdrup & Parcel, Inc., engr.-archt., Syndicate Trust Bldg., St. Louis, Mo., relocation hys. at Table Rock Dam White River near Branson, Mo., incl. 32.3 mi. hy., 6 bridges, altering bridge and small structures. CD 6/16/54.

▲ **Okla., Oklahoma City**—City, City Hall, widen., repave Western Ave. S. W. 29 to S. W. 59 St., $325,000; May Ave., from Reno Ave. to N. W. 23 St. $365,000; Robinson St. from S. W. 6 to S. W. 44 St., $275,000; Noble Ave., from May to Eastern Aves., $450,000; grading, paving Tinker Blvd. from Reno to Midwest City Blvd., $375,000. W. W. Baker, city engr.

▲ **Tex., Brownsville**—Cameron Co., Brownsville, defeated bonds July 23, road imprvs. Prec. 1, $750,000; Prec. 2, $75,000; Prec. 3, $750,000; Prec. 4, $750,000. CD 6/28.

▲ **Que., Quebec City**—City, City Hall, new pavings and opening and widening of streets $2,257,956.

EARTHWORK, WATERWAYS

▲ **Mich., Royal Oak**—SCHOOL—Royal Oak Twp., Leonard Maker, secy, Lamphere School Bd., John R and 13 Mile Rd., $1,000,000 bond election Sept. 20, elementary school, $500,000. Earl G. Meyers, 806 Farwell Bldg., Detroit, archt. CD 6/27.

▲ **Pa., Morgantown**—SCHOOL—Twin Valley Joint School System, Morgantown, plans by Buchart Engineering Corp., 920 Columbia Ave., Lancaster, junior-senior high school, $1,000,000.

▲† **Texas**—U. S. Eng., Box 1229, Galveston, embankment and relocations, $850,000; access roads, $90,000; project bldgs., incl. shop, $100,000 near Beaumont, McGee Bend Dam on the Angelina River. CD 6/9/44.

▲ **Tex., Newton**—Newton County Water Supply Dist., Newton, bond election August 27, water retention dam across Cow Creek, 1 mi. northwest of here, 55 ft. high, 4,000 ft. long, impound 70,000 acre ft. water, $2,350,000; side ditching and dirt drainage work, $150,000.

▲ **Wash., Seattle**—SPORTS CENTER, etc.—City, County-City Bldg., civic sports center, with 12,000 seat coliseum, $2,900,000.

AIRPORTS

▲ **Ala., Birmingham**—ADMINISTRATION BLDG.—Birmingham City Aviation Advisory Council, City Hall, administration bldg., Municipal Airport. $4,000,000. Construction within 2 years. CD 12/4/44.

(Continued on pg. 85)

Save 5¢ to 15¢ Per Sq. Ft., Every Pour, with Compo Forms

What makes costs so high on so many concrete forming jobs? Usually it's:

1. Handling, fitting and stripping heavy, cumbersome forms.
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IRVINGTON FORM & TANK CORPORATION

DEPARTMENT EN8, 20 VESEY STREET, NEW YORK 7, N. Y.

Over 35,000 feet of Clay Pipe, in diameters from 8 to 36 inches, will be installed over a 10-year period in Daytona Beach. Directing the project are City Manager LeRoy Harlow, City Engineer C. B. Moneypenny, Water and Sewer Superintendent Ralph Brennan, and Project Engineer C. E. Cannon of Metcalf & Eddy, Engineers.

Again . . . CLAY PIPE SOLVES A CORROSIVE SEWER GAS PROBLEM

CLAY PIPE FITTINGS are always available to handle every twist and turn in the line. This "Y" Fitting, for example, eliminates the need to improvise makeshift joints between feeder lines and mains.

Engineers faced a double problem on the $667,000 bond-financed sewerage project in Daytona Beach, Fla. The sewage has a high content of corrosive hydrogen sulphide, and the sandy soil has a high water table. Vitrified Clay Pipe with hot-poured joints solved both of these problems.

As experienced sanitary engineers know, *Clay Pipe is guaranteed for 50 years . . .* valuable "insurance" for any bond-financed project. When public health and the taxpayers' money are at stake, why take chances with substitute materials? Specify Vitrified Clay Pipe—and be *sure* the job will last.

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PIPE

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206 Connally Bldg., Atlanta 3, Ga.
100 N. LaSalle St., Rm. 2100, Chicago 2, Ill.
703 Ninth & Hill Bldg., Los Angeles 15, Calif.
311 High Long Bldg., 5 E. Long St., Columbus 15, Ohio

C-655-2

(Continued from pg. 82)

▲† **Ariz., Nogales**—WEATHER STATION—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., Air Force weather station. $2,000,000. Johannessen & Giraud, First Natl. Bank Bldg., Phoenix, consult. engrs.

▲† **Ariz., Tucson**—HANGAR, UTILITIES—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., plans by John Brenner & Assoc., 114 W. Adams St., Phoenix, hangar and utilities, Davis-Monthan Air Force Base. $3,000,000. CD 8/27/54.

▲† **Ariz., Yuma**—AIRPORT BLDGS., etc.—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., plans by Charles G. Polacek, 2803 N. 7th Ave., Phoenix, base chapel exchange store, shop, administration bldgs. $1,100,000; plans by John Brenner & Assoc., 114 W. Adams St., Phoenix, hospital, $1,400,000; plans by Scholer, Sakellar & Fuller, 2566 N. Campbell Ave., Tucson, airmens' dormitories, concrete block const. $270,000. foregoing at Yuma County Airport. CD 9/3/54.

▲† **Calif., Beale Air Force Base**—HOSPITAL—U. S. Eng., 751 S. Figueroa St., Los Angeles, plans by John Brenner & Assoc., 114 W. Adams St., Phoenix, Ariz. 75-bed 3-story rein.-con. hospital. $1,400,000. CD 1/14/52.

▲† **N. D., Minot**—JET FIGHTER BASE—U. S. Eng., 1709 Jackson St., Omaha, Neb., plans by W. F. Kurke & Assocs., 1117 13th Ave. N., Fargo, Jet Fighter Base, incl. eleven bldgs. $4,000,000-$6,000,000; addnl. bldgs. and utilities, est. $2,000,000-$3,000,000. Henningson, Durham & Richardson, 2962 Harney St., Omaha, Neb., consult. engrs. CD 2/10/55.

▲† **Tex., Etoile**—JET TRAINING BASE—U. S. Eng., Box 1229, Galveston, covered hangars, $750,000; shops, $300,000; runways-taxiways, $500,000. Turner & Bear, 2502 S. MacGregor St., Houston, consult. engrs.; barracks, messes, allied bldgs., $585,000; jet fueling sys. $200,000; water sys., $75,000; storm sewers, drainage, $75,000; sanitary sewer sys. $85,000; site area earthwork, grading, filling, leveling, $100,000; general paving in certain areas, $80,000.

▲† **Tex., Victoria**—AIR BASE BLDGS. etc.—U. S. Eng., Box 1229, Galveston, plans by Wilson, Morris & Crain & Assocs., 33330 Graustark St., Houston, consult. engrs.—archts., control tower, armament and electronic shop, build-up shop, engineering build-up shop, hangar shop, chapel, NCO and officers clubs, Foster Air Force Base. $5,000,000.

LATIN AMERICA

▲ **Guatemala**—Govt. of Guatemala, Guatemala City, Atlantic Highway, incl. 190 mi. Guatemala City and Puerto Barrios on Caribbean, with branch to Santo Tomas; Pacific Highway, incl. 37 mi. between Taxisco and El Salvador border and 47 mi. between Coatepeque and the Mexico border. Project to be completed by 1958. $40,000,000.

▲ **Mexico, Orizaba**—Cementos Veracruz, S. A., Orizaba, Vera Cruz, plans 450-ton daily capacity cement factory, $2,500,000.

▲ **Venezuela**—Ministry of P. Wks., Caracas, plans new airports at Santo Domingo, San Cristobal, La Azulita (Merida State) and Porlamar; imprvs. at airports in Cd. Bolivar and Barcelona, paving work at Palo Negro Air Base, building for Carrizal Air Base, home of new Military Aviation School, landing fields in Maracaibo and for new ATC buildings. $8,500,000.

▲ **Venezuela, Caracas**—Venezuelan Institute of Social Security, Caracas, plans 15 story building. $1,500,000.

AMERICANS ABROAD

▲ **The Netherlands, Leyden**—PLANT—Reed Roller Bit Co., 6501 Navigation Blvd., Houston, Tex., U. S. A., plans rock bit mfg. plant. $4,500,000.

PUBLIC BUILDINGS

▲ **Ala., Birmingham** — MEDICAL CENTER — University of Alabama, Tuscaloosa, plans by Van Keuren, Davis & Co., 3007 7th Ave. S., Birmingham, University of Alabama Medical Center expans., incl. 7-story nurses home; plans by Jack B. Smith, Brown Marx bldg., medical center library. Total est. $10,000,000-$12,000,000. E. Todd Wheeler, 736 S. Ashland Ave., Chicago, Ill., consult. archt. for Medical Center expan. program. CD 5/12/53.

▲ **Colo., Golden**—METALLURGY—Colorado School of Mines, Campus, Golden, plans by Fuller, Fuller & Fuller, consult. engrs.-archts, Insurance Bldg., Denver, 3 story, brick metallurgy bldg. $1,000,000.

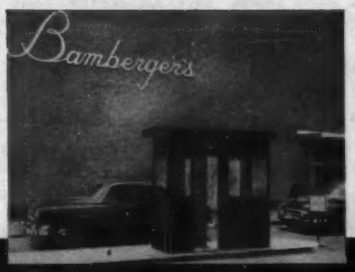
▲† **Md., Germantown**—HEADQUARTERS—U. S. Atomic Energy Comm., 1901 Constitution Ave. N. W., Wash., D. C., plans by Voorhees, Walker, Smith & Smith, 101 Park Ave., New York, N. Y., 3 story AEC headquarters building, garage and maintenance bldg., Rte 118, near here, $10,000,000. CD 7/7, under Wash., D. C.

▲ **Mich., Kalamazoo** — LIBRARY-MUSEUM — City, Bd. Educ., plans by Louis C. Kingscott & Assoc., 511 Monroe St., 2 story library-museum bldg., $1,200,000.

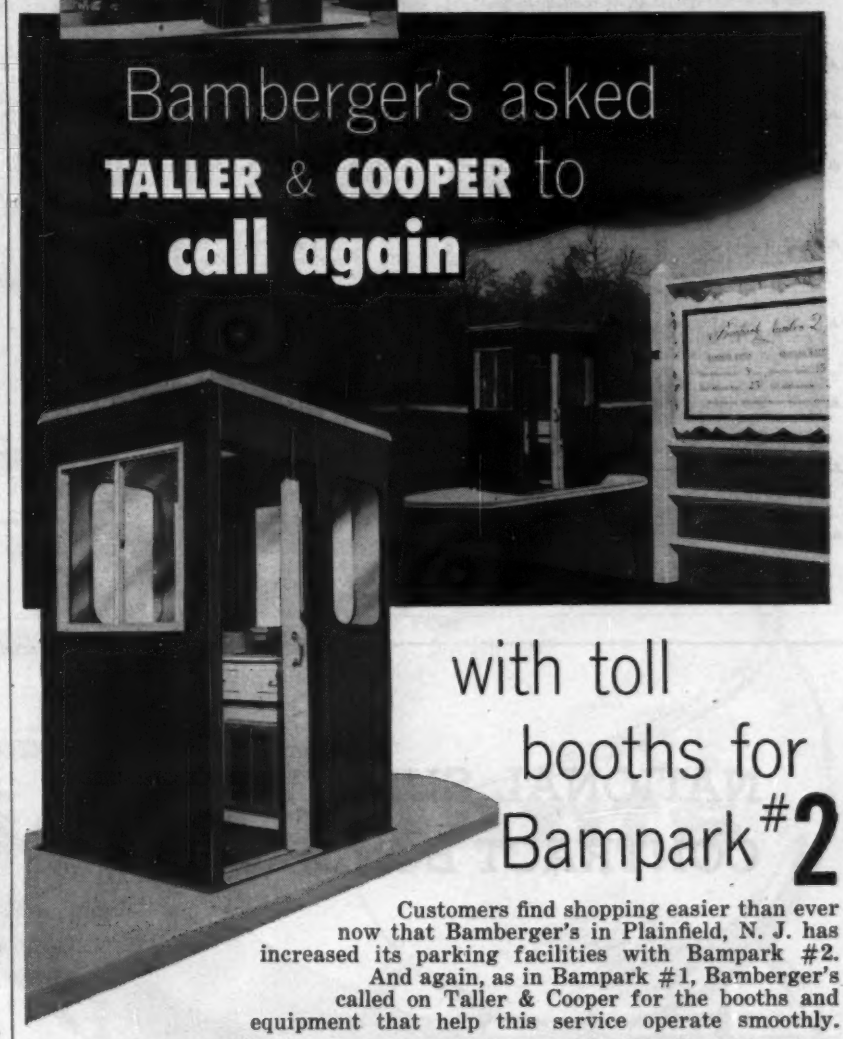
▲ **Mich., Portage** — SCHOOL — Portage Twp. School Dist., Bd. Educ., junior high school, $1,600,000.

▲ **Mich., Flint**—COLLEGE AND CULTURAL CENTER—University of Michigan and Flint Junior College, Flint, plans by Smith-Hinchman & Grylls, Inc., 800 Marquette Bldg., Detroit, College and cultural center incl. 12 bldgs., library, cultural theater, Senior and Junior College, $12,500,000.

(Continued on next pg.)



Bampark #1 for the convenience and shopping ease of customers, at Bamberger's, Plainfield, N. J. proved to be an aid to customer relations, as well as traffic control, by providing quick, courteous service.



Bamberger's asked **TALLER & COOPER** to **call again**

with toll booths for Bampark **#2**

Customers find shopping easier than ever now that Bamberger's in Plainfield, N. J. has increased its parking facilities with Bampark #2. And again, as in Bampark #1, Bamberger's called on Taller & Cooper for the booths and equipment that help this service operate smoothly.

Taller & Cooper Booths are functionally designed to provide pleasant working conditions for personnel. Prefabricated of rugged accident proof steel, these Booths are delivered to the site completely assembled for immediate installation.

With 25 years of experience in toll collection equipment, Taller & Cooper can help you solve your tool problems, whether for an individual parking lot or a complete highways system.

WRITE TODAY for design and construction details

TALLER & COOPER, INC.

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75 FRONT STREET • BROOKLYN 1, NEW YORK

TALLER & COOPER TOLL COLLECTION EQUIPMENT is USED on EVERY MAJOR TOLL FACILITY in the U. S.

▲ **N. Y., Brooklyn**—SCHOOL—Bureau Constr., Bd. of Educ., 42-12 Crescent St., Long Island City, plans by Richard Roth, 575 Madison Ave., New York, Zone 22, 3 story Junior high school No. 278, 1925 Stuart St., $2,847,000.

▲ **Wis., West Allis**—HOSPITAL—City, City Hall, hospital $2,500,000.

▲ **Alta, Edmonton**—NURSES HOME—Province of Alta., University Hospital Bd., Edmonton, four story, two wing nurses home addn. at the University Hospital. est. $1,000,000. Bids in late summer or early fall.

COMMERCIAL BUILDINGS

▲ **Calif., Glendora**—SHOPPING CENTER—Paul J. Davetti, 1138 Herring Ave., West Covina, plans by H. W. Underhill, 4313 Leimert Blvd., Los Angeles, 12 bldgs., 90,000 sq. ft. shopping center, Pasadena and Alosta Aves., 600-car parking area. $1,000,000.

▲ **Calif., Ignacio**—HOMES—Del Preston Constr. & Realty Co., Mill Valley, 250 home sub-division, $3,500,000.

▲ **Calif., LaMesa**—HOMES—Hobart-Southern Co., P. O. Box 787, Chula Vista, 114 homes, Lake Murray Subdivision, $1,145,000.

▲ **Calif., Pomona**—SHOPPING CENTER—Bershon Constr. Co., 11231 W. Pico Blvd., Los Angeles, plans by H. W. Underhill, 4313 Leimert Blvd., Los Angeles, 13 bldgs., 126,650 sq. ft. shopping center, Garvey and Harrison Aves. $1,500,000.

▲ **Calif., Puente**—SHOPPING CENTER—H. S. Shapiro & Assoc., 2110½ S. Atlantic Blvd., Los Angeles, plans by H. W. Underhill, 4313 Leimert Blvd., Los Angeles, 112,000 sq. ft. shopping center, Hacienda and Gale Aves., 1,000-car parking. $1,750,000.

▲ **Calif., San Diego**—RESEARCH—Western Research Foundation of San Diego, 418 Land Title Bldg.; San Diego, Zone 1, plans by Lloyd Ruocco, 3605 5 Ave., Zone 3, industrial, scientific research facilities on Kearney Mesa site, $4,000,000.

▲ **Calif., San Mateo**—HOMES—J. L. Eichler & Sons, 2001 El Camino Real, Palo Alto, 275 home sub-division vicinity Crystal Springs Rd. off Skyline Blvd. $6,000,000.

▲ **Calif., Santa Venetia**—HOMES—Billings-Hutchison & Co., 58 Sutter St., San Francisco, 170 home subdivision, $2,890,000. Punnett-Parez & Hutchison, 58 Sutter St., San Francisco, consult. engrs. CD 5/2.

▲ **Conn., Berlin**—RESTAURANT—Albert M. Levitt Co., Inc. 100 College St., New Haven, restaurant and banquet hall, parking for 2,000-cars, Wilbur Cross Hy. $1,000,000. Raymond Loewy Assoc. 488 Madison Ave., New York, N. Y. designer. CD 5/7/54.

▲ **Mich., Saginaw**—SHOPPING CENTER—Edwin Gage, 500 S. Washington St., Royal Oak, plans by Frederick E. Wigen, 507 Wiechmann Bldg., Saginaw, Tri-City Shopping Center, $1,000,000.

▲ **N. Y., New York**—OFFICE—New England Industries, Inc., 120 Wall St., Zone 5, 16 story office at 515 Park Ave. southeast corner of 60 St., $1,000,000.

▲ **N. Y., New York**—APARTMENT—Harold Schneider, c/o Sylvan Bien, archt., 33 W. 46 St., Zone 19, 20 story apartment, First Ave. and 57 St. $2,500,000.

▲ **O., Cincinnati**—SHOPPING CENTER—North Cincinnati Shopping Center, c/o S. A. Marks, Traction Bldg., regional shopping center incl. 45 stores on approx. 40 acres on Rte. 4 near Mack and Ross Rds., $4,000,000.

▲ **Pa., Phila.**—RESIDENTIAL DEVELOPMENT—Sidney Robin, 4745 N. 12 St., residential development Frankfort Ave., $1,000,000.

▲ **Tenn., Nashville**—STORE—Cain-Sloan Co. (Allied Stores Corp.) 209 5 Ave. N., store addn. and parking lot. $6,000,000. CD 10/1/51.

▲ **Tex., Carrollton**—DWELLINGS—The Cato Corp., 9747 H. Hines Blvd., Dallas, 35 dwellings, $366,125; 38 dwellings, $384,445; 30 dwellings, $352,400; 36 dwellings, $377,000; 41 dwellings, $396,550; 44 dwellings, $419,600, large track near limits of Carrollton.

▲ **Tex., El Paso**—DWELLINGS—Sam Guido & Assocs., Caples Bldg., El Paso, (A) 28 dwellings, $380,165 (B) 32 dwellings $396,000 (C) 20 dwellings, $346,200 (D) 35 dwellings, $350,000 (E) 24 dwellings, $363,900 (F) 38 dwellings, $414,160 (G) 26 dwellings, $373,190 (H) 30 dwellings, $356,100, further designated development in large residential subdivision.

▲ **Tex., Houston**—DWELLINGS—Embe Associates, 101 Bearle St., L. Bernheimer, 30 dwellings $350,000; 41 dwellings, $395,100; 45 dwellings $423,500; 43 dwellings, $398,515; 38 dwellings, $381,405; 47 dwellings, $436,600; 32 dwellings, $346,060; 37 dwellings, $370,000; 35 dwellings, $355,190, in Cloverland Subdivision.

▲ **Tex., Pasadena** — STORE — Sears, Roebuck & Co., Pasadena Tex. and 4207 Main St., Houston, plans by Cowell & Neuhaus, 5619 Fannin St., Houston, proj. archts.-engrs. 178,220 sq. ft. masonry, steel mercantile retail store. $2,225,000. CD 7/22.

▲ **Tex., Richardson**—DWELLINGS—George M. Underwood, Jr. & Assocs., New Belt Line Rd., 22 dwellings, $365,000; 36 dwellings, $374,600; 20 dwellings, $345,000; 32 dwellings, $368,185; 28 dwellings, $348,500; 25 dwellings, $367,500, in Richardson Heights.

▲ **Tex., Richardson**—DWELLINGS—Lindsay Embry, W. T. Troth & Assocs., c/o G. M. Underwood, New Belt Line Rd., 30 brick dwellings, $370,000; 19 masonry dwellings, $347,500; 28 brick dwellings, $362,400; 26 brick dwellings, $347,715; 24 brick dwellings, $345,000; 32 brick dwellings, $391,500; 36 brick dwellings, $416,525 in Richardson Heights.

▲ **Tex., San Antonio**—DWELLINGS—N. O. Simmons Bldg. Co., Box 521, Beacon Hill Sta., San Antonio, 25 dwellings, $350,760; 28 dwellings, $369,500; 31 dwellings, $376,000; 33 dwellings, $381,125; 41 dwellings, $390,600; 41 dwellings, $410,445; 38 dwellings, $395,000; northside off N. McCullough Ave.

▲ **Tex., Victoria**—DWELLINGS—E. J. Dysart, Dave Jack & Assocs., Victoria, 40 frame dwellings, $376,600; 37 frame dwellings, $369,875; 35 frame asb. siding dwellings, $358,776; 43 frame dwellings, $396,615; 30 frame, brick trim dwellings, $355,500; 25 frame veneer dwellings $350,500; 20 frame, brick stone dwellings $351,750, in area Mayfair Terrace Subdivision.

▲ **Que., St. Martin**—HOUSING—New York Investment Corp., 8255 St. Lawrence Blvd., 300 units housing program, incl. bungalows, duplexes and apartment type bldgs. $3,000,000.

INDUSTRIAL BUILDINGS

▲ **Calif., San Diego**—PLANT—San Diego Gas & Electric Co., 861 6th Ave., Zone 1, gas distribution plant, 35th and Market Sts. $1,000,000. CD 11/24/50.

▲ **Pa., Phila.**—GAS MANUFACTURING and DISTRIBUTION SYSTEM—Phila. Gas Works Co., 1401 Arch St., gas mfg. and distribution system expansion, $10,000,000.

▲ **Wis., Cassville**—GENERATING PLANT—Wisconsin Power & Light Co., 122 W. Washington St., Madison, steam electric generating plant, $20,000,000. Sargent & Lundy, 140 S. Dearborn St., Chicago, Ill., consult. engrs. Construction in 1957. CD 7/27/54.

UNCLASSIFIED

▲ **Missouri**—TRANSMISSION LINE—Union Electric Co. Missouri, 315 N. 12 Blvd., St. Louis, Zone 1, 138,000 volt transmission line from Rivermines, sub-station to Cape Girardeau to connect with Missouri Utilities Co. system, $2,000,000. CD 1/10.

▲ **Texas**—TELEPHONE LINES—Mid-Texas Telephone Co., South Texas Bldg., San Antonio, exten. rural telephone service, lines, etc., Lampasas, Coryell and Bell Counties. $1,850,000. REA allot.

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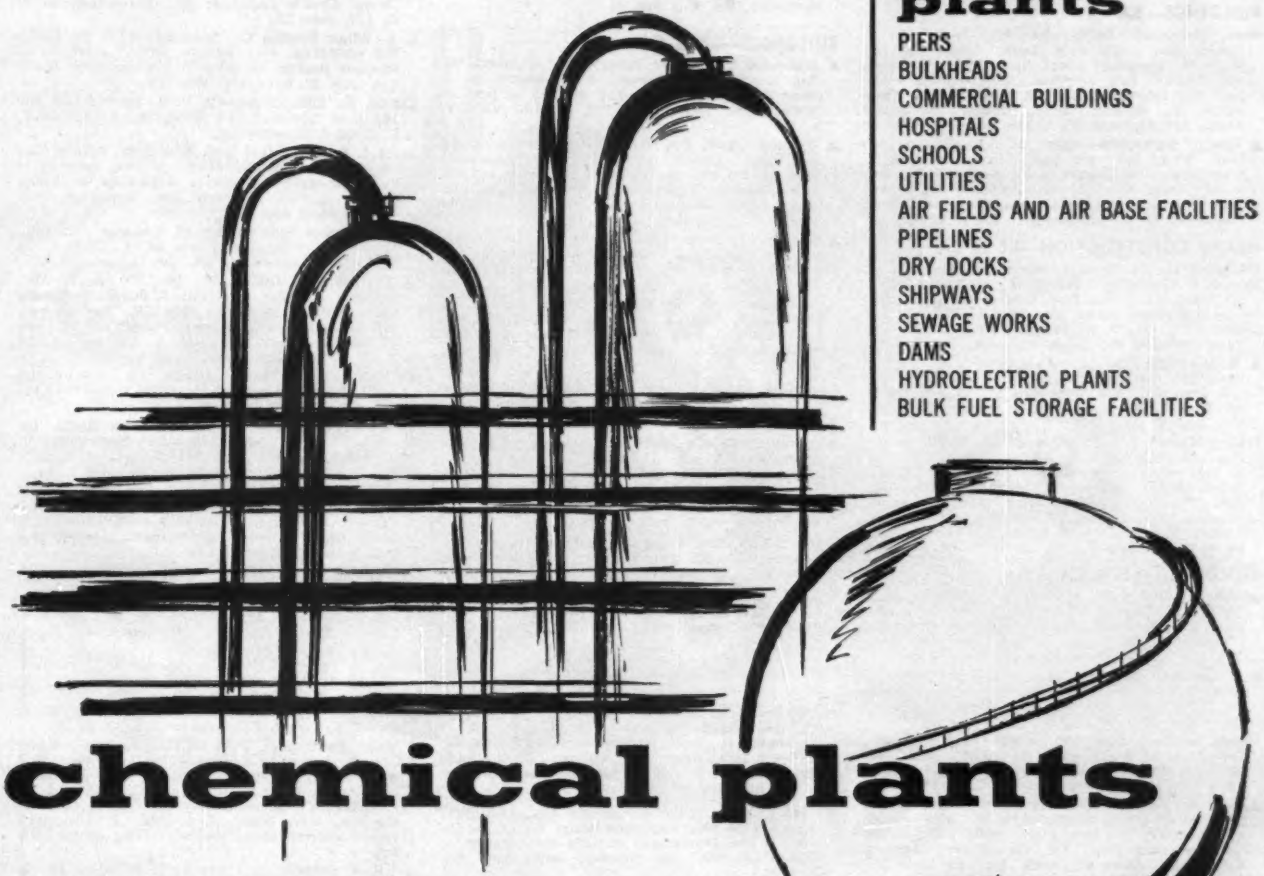

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- Nicaro, Cuba — Nickel Reduction Plant expansion for National Lead Company*
- Portsmouth, Ohio—two structures for Atomic Energy Plant
- Ft. Hood, Texas—Water Treatment Plant for U.S. Army Corps of Engineers

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

▲ **MASSACHUSETTS**—BA 9/7—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Boston-Dorchester—hy. and bridge Southeast Expressway Southampton St. to Neponset Circle, $7,500,000. Plans deposit $40 refundable. Edwards, Kelcey & Beck, 165 Congress St., Boston, engrs. CD 2/17/54.

▲† **Mass., Chicopee Falls**—APRON—BA On Or About 9/16—U. S. Eng., 857 Commonwealth Ave., Boston, Zone 15, operational parking apron and hydrant fueling sys., Westover Air Force Base, Eng-19-016-56-21, $2,000,000. Plans deposit $10.

BUILDINGS—BA

Mass., Arlington—SCHOOL—BA 9/1—Town, M. E. Santini, chn. School Bldg. Comn., School Dpt., 23 Maple St., elementary school, North Union and Everett Sts. District, East Arlington, $894,000. Plans deposit $50 refundable. Harry J. Korslund, 506 Washington St., Norwood, archt., Goldberg LeMessuier Assoc., 739 Boyleston St., Boston, engrs. CD 7/27.

▲ **Conn., Wallingford**—HIGH SCHOOL—BA 9/13—Town, School Dpt., c/o Supt. Schools at Moses Y. Beach School, Wallingford, Conn. 54-C-405 AA, high school, South Elm St. $2,500,000. Plans deposit $100. Charles A. Maguire & Assoc., Turks Head Bldg., Providence, R. I., archts.-engrs. CD 10/22/52.

HEAVY CONSTRUCTION—LB & CA

MAINE—State Hy. Comn., State House, Augusta,
Me.—J. R. Cianchette, Pittsfield, Me. CA $390,553. bit. con. road 2.182 mi., Proj. D-RD-5 (2), 1, Bangor;
Me.—Lee Brothers, Albion, Me. CA $261,931. bit. con. road 3.252 mi., F. A. Secondary Proj. S 0226 (2), "226" Winslow and China. Bids Aug. 3. CD 7/28.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Farina Bros. Co., 429 Watertown St., Newton, Mass. LB $5,469,289. grade crossing elimination, Salem. Bids Aug. 9. CD 6/24.

Peabody Constr. Co., 27 Farragut Rd., South Boston, Mass. LB **$463,184.** est. $500,000. P-M 42 Contr. No. 3, fire protection renovation plumbng, WORCESTER, MASS. State, Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Willam W. Drummey, 80 Boyiston St., Boston, Mass., archt. Richard D. Kimball Co., 6 Beacon St., Boston, Mass., mech. engr. CD 12/17/52, under Public Buildings.

BUILDINGS—LB & CA

▲ **Jefferson Constr. Co.**, 75 First St., Cambridge, Mass. CA **$2,031,000.** Est. $2,440,000. high SCHOOL West Main St., HYANNIS, MASS. Town of Barnstable, c/o H. H. Broadbent, supt. schools, Town Office Bldg., 397 Main St., Hyannis, Mass. CD 7/27, under LB.

R. R. Jacobucci, Inc., 28 Dayton St., Quincy, Mass. LB $436,790. est. $450,000. elementary SCHOOL Albion Rd., WELLESLEY, MASS. Town, Seaward Rd., Wellesley, Mass. Bids Aug. 4. CD 7/20.

Thomas Lanese & Sons, 190 Calhoun Ave., Bridgeport, Conn., CA, **$350,000.** HOSPITAL ADDN., 2820 Main St., BRIGDEPORT, CONN. St. Vincent's Hospital 2820 Main St., Bridgeport, Conn. CD 4/19/54.

▲ **Aberthaw Co.**, 80 Federal St., Boston, Mass., CA Est. **$9,000,000.** 1 story 1,000,000 sq. ft. brick research LABORATORY, Brainerd Field, HARTFORD, CONN. The Underwood Corp., 581 Capitol Ave., Hartford, Conn. Cabot, Cabot & Forbes, Inc., 60 State St., Boston, Mass., engr. and agent. CD 7/51.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲† **New York**—BA 8/30—U. S. Eng., Engineer Park, Niagara and Bridge Sts., Buffalo, remove 893,000 cu. yd. material from south harbor, Buffalo River and Ship Canal; remove 72,032 sq. yd. rock from Buffalo River entrance and harbor deepening proj., Buffalo, Erie Co., CIVENG-30-023-56-4. $2,000,000. Plans deposit $25.

BUILDINGS—BA

N. Y., Braircliff Manor—SCHOOL—BA 9/13—Union Free School Dist. No. 2, High School, Braircliff Manor, elementary school, $500,000. Plans deposit $25. Carr & Wiggins, 80 W. 40 St., New York, archts.

▲ **N. Y., Brooklyn**—SUPREME COURT—BA 9/21—Dpt. P. Wks. Municipal Bldg., New York, Zone 7, Contr. No. B1 general constr.; Contr. No. B2 plumbing work; Contr. No. B3 heating and ventilating work; Contr. No. B4 electrical work for new supreme court bldg., Brooklyn Civic Center, Phase B. Plans deposit $100. CD 10/11/49.

BUILDINGS—SLC

Pa., New Castle—FACTORY—Johnson Bronze Co., New Castle, soon lets contract, 1 story, brick, steel factory, $500,000. CD 5/31.

HEAVY CONSTRUCTION—LB & CA

▲ **PENNSYLVANIA**—Pennsylvania Turnpike Comn., 11 N. Fourth St., Harrisburg,
Phoenix Bridge Co., Phoenixville, Pa. CA **$2,501,454.** superstructures of Clarks Summit Bridge (sec. 370) and Lackawanna River Bridge (sec. 37K), northeastern extension, Lackawanna Co. CD 7/29, under LB.

▲ **Rogers Constr. Co.**, R. D. Bell Mountain, Scranton, Pa. LB **$1,277,695.** Section 37K (south); LB $1,060,650. Section 37 (north) and Section 37L, slushing of mine area on northeastern extension, Lackawanna Co. PENNSYLVANIA. Pennsylvania Turnpike Comn., 11 N. Fourth St., Harrisburg, Pa. Bids Aug. 10. CD 7/29;
William Heck, 286 Kitter St., Wilkes-Barre, Pa. LB **$78,146.** section 37J (Pennsylvania.)

Wright Contg. Co., 504 25 Ave., Columbus, Ga. LB **$340,247.** storm drain in Colmar Manor Anacostia River Flood Control and Navigation Proj. 82-D, Bladensburg and Edmonston, HYATTSVILLE, MD. Washington Surburban Sanitary Comn., Hamilton St., Hyattsville, Md. Bids Aug. 8.

BUILDINGS—LB & CA

▲ **Whitewood Estates**, c/o Erwin Gerber & James Pancani, archts., 1180 Raymond Blvd., Newark, N. J. Owner Builds, **$3,500,000.** 150 HOUSES on tract on Germondo Rd. east of Rte 304, SPRING VALLEY, N. Y.

▲ **Simpson Constr. Co.**, Toms River, New Jersey, CA **$1,079,000,** general contr., SERVICE BLDGS. In areas 6N and 6S, near Yardville, Mercer Co. on New Jersey Turnpike. NEW JERSEY. New Jersey Turnpike Auth., Admin. Bldg., New Brunswick, N. J. Bids June 7. CD 7/11 under LB.

▲ **Meadowcroft Homes**, c/o Pasford Ltd., 37-01 Broadway, Fairlawn, N. J., Owner Builds, **$1,600,000.** 78 HOUSES on tract on Fair Lawn Ave. west of Saddle River Rd., 2nd section, FAIRLAWN, N. J.

▲ **Woodlawn Acres Homes**, c/o Pasford Ltd., 37-01 Broadway, Fairlawn, N. J. Owner Builds, **$1,250,000.** 62 HOUSES on tract on Morris Turnpike and Washington Valley Rd., 2nd section, MOUNT FREEDOM, N. J.

Coca Cola Bottling Works of Johnstown, Johnstown, Pa. Owner Builds, **$250,000.** 2 story, 100x147 ft., brick, block bottling PLANT, JOHNSTOWN, PA.

▲ **Larson Constr. Co.**, 300 Mt. Lebanon Blvd., Pittsburgh, Pa. CA est. **$3,500,000.** 8 story, bsmnt., brick, APARTMENT, PITTSBURGH, PA. 401 Shady Avenue, Inc., 1714 Investment Bldg., Pittsburgh, Pa. (Correction—Contracter changed). CD 3/31, under **CA.**

Ragnor Benson, Inc., 2 Gateway Center, Pittsburgh, Pa. CA Est. **$700,000.** 4 story, bsmnt., steel, frame child GUIDANCE CENTER, PITTSBURGH, PA. University of Pittsburgh, Fifth and Bigelow Sts., Pittsburgh, Pa. CD 6/30.

† **Blount Bros. Constr. Co.**, Bell Bldg., Montgomery, Ala. LB **$427,000.** est. $100,000-$500,000. BLDG. 375 addn., ENG-49-080-56-5-(4), CAMP DETRICK, MD. U. S. Eng., First and Douglas Sts., N.W., Wash., D. C. Bids Aug. 4. CD 7/26

Jos R. Hughes & Co., 5 E. Franklin St., Baltimore 2, Md. LB **$652,000.** est. $400,000. 1 story, 29x270 ft., 60x110 ft., steel, masonry central STORAGE and KITCHEN Spring Grove State Hospital, CATONSVILLE, MD. State Dpt. P. Imprvs., 506 Park Ave., Baltimore 1, Md. Bids Aug. 4. CD 7/19.

Warthen & Ward, 10410 Montgomery Ave., Kensington, Md. LB **$456,590.** Washington Motor HOTEL on 15-acre site Rte. 240 between Rockville and Caithersburg, ROCKVILLE, MD. Jack Wamsley, Caithersburg, Md. CD 4/28.

▲ **Novak, Sills & Novak**, 1012 14 St., N. W., Wash., D. C., Owner Builds, **$1,440,000.** 96 brick detached HOMES, WHEATON, MD. John D'Epagnier, 1004 Riply St., Silver Spring, Md., archt.

▲ **Skinker & Garett**, 2607 Connecticut Ave., N.W., Wash. D. C., LB **$1,382,000,** NURSES DORMITORY, WASH. D. C. Georgetown University, 37th and O Sts., N. W., Wash. D. C. Bids Aug. 10. CD 7/13.

SOUTH

HEAVY CONSTRUCTION—LB & CA

† **NORTH CAROLINA**—Bureau P. Rds. Dpt. Commerce, 1440 Columbia Pike, Arlington, Va.

W. E. Graham & Sons, Cleveland, N. C., LB **$441,470** Proj. 2G2, grading, draining, crushed grav. or stone base course and other work from Sandy Flat Gap north 4.6 mi., Blue Ridge Parkway, Watauga Co. Bids Aug. 4. CD 7/12.

† **Frederick Raff Co.**, Liberty Life Bldg. Charlotte, N. C. CA **$698,893,** on Item No. 6, heating plants and distr., Seymour Johnson Air Force Base, ENG-31-075-55-61. GOLDSBORO, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids July 19. CD 6/15.

FLORIDA—State Road Dpt., Tallahassee,
H. E. Wolfe Constr. Co., St. Augustine, Fla., CA, **$683,270** maint. traffic, grading roadway, rock base with b. conc. surf. course with binder course, storm sewers widn. 1 concrete, steel bridge, etc. 3.293 mi. State Rd. 5, Fed. Aid Proj. U 003-2(4) Dade Co. Bids May 31, awarded Aug. 5. CD 6/6, under LB.

▲ **Al Johnson Constr. Co.**, 608 Foshay Tower, Minneapolis 2, Minn., CA est. **$10,000,000.** Chilhowee Hydro-Electric Proj. on Little Tennessee River, near Calderwood, incl. 1,400 ft. dam, 82 ft. high. TENNESSEE. Aluminum Co. of America (Tapco Div.) 1200 Alcoa Bldg., Pittsburgh 19, Pa. CD 10/27/54.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,
George M. Eady Co., 340 Byrne St., Louisville, Ky., second low bidder at **$1,460,218** has been offered contract to construct 0.417 mi. North-South Expressway, Jefferson Co. Former contractor declined to execute contract. CD 7/15, under CA.

BUILDINGS—LB & CA

▲ **Samuel Selsky and Louis Zion**, 1401 "K" St., N.W. Wash., D. C., Owner Builds. Est. **$1,455,000.** 97 brick detached HOMES, between Shirley Hy. and Duke St. ALEXANDRIA, VA. John D'Epagnier, 1004 Ripley St., Silver Spring, Md., archt.

▲ **Patterson-Emerson-Comstock Co. Inc.**, Brown Marx Bldg., Birmingham, Ala., CA **$3,250,000.** electrical work on $20,000,000 PLANT, HICKORY, N. C. General Electric Co., River Rd., Schenectady, N. Y. CD 6/7, under CA.

G. L. Wilson Building Co., Statesvile, N. C. CA $741,-700 HOSPITAL. Proj. NC 176, MOUNT AIRY, N. C. Northern Hospital of Surry Co., Mount Airy, N. C. Bids June 7. CD 6/17, under LB.

Lee Co. Bd. Educ., Bishopville, N. C., rejected bids July 12, three SCHOOLS, LB **$554,706,** BISHOPVILLE, S. C. CD 7/20, under LB.

Henry C. Beck Co., First Natl. Bank Bldg., Atlanta, Ga., CA Approx. **$500,000.** PLANT to mfr. batteries in Fulton County Industrial area. ATLANTA, GA. Globe-Union, Inc., 900 E. Keefe Ave., Milwaukee, Wis. **Awarded About Aug. 3.**

† **State School Bldg. Auth.**, 41 Exchange Pl., S.E., Atlanta, Ga. rejected bids June 30, 4 SCHOOLS, LB **$773,600,** HINESVILLE, GA. CD 7/11, under LB.

▲ **Emil Mueller Contr. Co. Inc.**, 70 South Ave., Rochester 4, N. Y., CA Est. **$2,000,000.** 30-store Roebuck Plaza SHOPPING CENTER, parking area, BIRMINGHAM, ALA. National Plazas, Inc., 19 W. 44 St., New York, N. Y. R. E. Van Alstyne, 70 South Ave., Rochester 4, N. Y. archt. CD 6/2.

Huntsville Hospital, Inc., Huntsville, Ala., rejected bids July 14, 3-story HOSPITAL ADDN., HUNTSVILLE, ALA. CD 7/13.

State Bldg. Auth., State Capitol, Baton Rouge, La. rejected bids, girls' dormitory at Southern University, SCOTLANDVILLE, LA. LB **$417,000.** CD 8/3, under LB.

Southern Builders, Inc., Box 1815, Shreveport, La. CA **$852,000.** gymnasium, musical facilities and remodeling of Byrd High SCHOOL, SHREVEPORT, LA. Caddo Parish School Bd., Shreveport, La. Awarded Aug. 3. CD 7/22, under LB.

J. A. Jones Constr. Co., Box 1818, Shreveport, La. CA **$829,700.** gymnasium, musical facilities and remodeling Fair Parks High SCHOOL Proj. 17, SHREVEPORT, LA. Caddo Parish School Bd., Shreveport, La. Neild-Somdal, 956 Jordan Ave., Shreveport, La., archts. Awarded Aug. 3. CD 9/14/51.

Forbes & Taylor, 361 Boiling Springs Dr., Lexington, Ky. LB **$579,792.** GYMNASIUM for Morehead State College, MOREHEAD, KY. State, Div. Purchases, Frankfort, Ky. Henry A. Spalding, Baker Bldg., Hazard, Ky., archt. Bids Aug. 4. CD 6/30.

† **Malan Constr. Co.**, 2509 42 St. Rd., Long Island City, N. Y. LB **$978,000.** BLDG. C-420 mechanical work, piping, processing, ventilating, vacuum system, refrigeration, electrical wiring, etc., Inv. 151-55-58, PADUCAH, KY. Atomic Energy Comn., 1901 Constitution Ave., N.W., Wash., D. C. Giffels & Vallet, Inc., 100 Marquette Bldg., Detroit, Mich., archt. Bids **Aug. 5.**

▲ † **H. K. Ferguson Co.**, 1783 E. 11 St., Cleveland, O. CA est. **$9,000,000.** Atomic Energy PLANT facilities and alterations, OAK RIDGE, TENN. U. S. Atomic Energy Comn., Oak Ridge, Tenn.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

† **O., Dayton**—DORMITORIES—BA 9/13—U. S. Eng., 830 W. Broadway, Louisville, Ky., 3 airmen dormitories, Wright-Patterson Air Force Base, Eng. 15-029-56-6, $900,000. CD 9/27/51.

BUILDINGS—BA

▲ **O., Warrensville (Br. Cleveland)**—HOSPITAL—BA 8/29—Cuyahoga County Hospital, Court House, Cleveland, Zone 13, general constr., heating and ventilating, plumbing and drainage, electrical work, elevators, kitchen equip. etc., required for alterations, addn. connecting bldgs. Nos. 1 and 2 at Cuyahoga County Hospital, Warrensville Twp., $1,500,000-$1,600,000. Plans deposit $50. Horn & Rhinehart, 1240 Huron Rd., Cleveland Zone 15, archts.

▲ **O., Toledo**—MARINE TERMINAL—Bids Asked—D. H. Overmyer Warehouse Co., 217 Cherry St., marine terminal incl. 10,000 sq. ft. warehouse, office adjoining cranes, etc., on east bank of Maumee River, $2,000,000. Hahn & Hayes, 723 Adams St., archts. CD 5/16.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus,
O.—Visintine & Co., 1315 Edgehill Rd., Columbus, O. CA **$1,130,000.** est. $1,096,500. Type T-35 on B-119 and structures, 1.613 mi. S.R.4, Sections (22.97-23.22) Lemon and Madison Twps. and city of Middletown, Butler Co.;
O.—Bruns Coal Co., Inc., P.O. Box 991, Zanesville, O. CA **$598,238.** est. $661,100, Type T-71 and structure 3.195 mi., U.S.R. 50, Sections (15.86-16.46) Athens and Canaan Twps., Athens Co. CD 8/3, under LB.

(Continued on page 90)

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(Continued from page 88)

BUILDINGS—BA

Goodrich-Gulf Chemicals, Inc., (B. F. Goodrich Co. and Gulf Oil Co.), 4317 Chester Ave., Cleveland, O. Own Forces, Est. $500,000. pilot PLANT to mfg. artificial rubber, AVON LAKE, O.

Leo E. Ruisinger Co., Inc., 851 Frebis Ave., Columbus, O. CA $483,525. general contract, HOSPITAL addn., DELAWARE, O. Jane M. Case Hospital, Delaware, O. CD 2/19/54.

† **National Concrete Fireproofing Co.,** 556 Terminal Tower, Cleveland, O. LB $852,028. depot maintenance SHOP for integrated fire control systems, Erie Ordnance Depot, Eng. 46-022-55-46, LACARNE, O. U. S. Eng., 237 Fourth Ave., Huntington, W. Va. Bids June 16. CD 5/24.

▲ **Frank Messer & Sons, Inc.,** 4612 Paddock St., and **Ferro Concrete Constr. Co.,** 203 W. Third St., Cincinnati, O. CA Total Est. $25,000,000. 172 kw addition to Walter C. Beckjord STATION, NEW RICHMOND, O. Cincinnati Gas & Electric Co., Fourth and Main Sts., Cincinnati 1, O.;
Babcock & Wilcox, 161 E. 42 St., New York 17, N. Y. CA furnishing and installing equip. (New Richmond, O.).

Berglund Maintenance Co., 8410 S. South Chicago Ave., Chicago, Ill., CA $585,355. Crane Technical HIGH SCHOOL addn., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago 1, Ill. Bids July 1, awarded July 27. CD 7/13 under LB.

▲ **S. M. Wilson & Co.,** 1616 Cleveland Ave., Granite City, Ill., CA, $1,125,000 general, plumbing and heating for SCHOOL bldgs. in Jerseyville, Dow, Fieldon, Delhi, Elsah School addns., Jersey Community High School, Kane and Jerseyville upper bldg. of elementary school, JERSEYVILLE, ILL. Community Unit School Dist. No. 100, Jersey and Greene Counties, Bd. of Educ., Jerseyville, Ill. Bids July 20. D. Clarence Wilson, 1115 Harrison St., Mt. Vernon, archt.

▲ **Allis-Chalmers Mfg. Co.,** 1953 Thomas St., Milwaukee 1, Wis., CA total est. $19,500,000. general unit for fourth sect. Oak Creek POWER PLANT, near here. MILWAUKEE, WIS. Wisconsin Electric Power Co., 231 W. Michigan Ave., Milwaukee 3, Wis. CD 11/22/50;
Combustion Engineering, Inc., 208 Madison Ave., New York, N.Y., CA boiler (Milwaukee, Wis.).

D. G. Beyer, Inc., 4204 Menomonee River Parkway, Wauwatosa, Wis., LB, $404,870 (5 bidders) general contract FOOD SERVICE bldg., for Hospital of Mental Diseases, WAUWATOSA, WIS. Milwaukee County Institutions, Wauwatosa, Wis. Bids Aug. 4. M. Pfaller & Assocs., 7613 W. State St., Wauwatosa, archts. CD 1/5/51.

T. V. John & Son Inc., 13555 W. Juneau Blvd., Milwaukee, Wis., LB, $665,000 general contract, Wildwood SCHOOL, WEST ALLIS, WIS. Bd. of Educ., 7510 W. National Ave., West Allis, Wis. Bids Aug. 1. CD 7/7.

▲ **Holly Hills Development,** Leonard Wolfe, 13 Mile and Middlebelt, Farmington, Mich., Owner Builds, $1,700,000. Holly Hills Subdivision and 78 HOMES, FARMINGTON, MICH.

▲ **Collins & Catlin,** Port Huron, Mich. CA $1,157,725. general contract, high SCHOOL, PORT HURON, MICH. City, J. F. Gibbs, city mgr., Port Huron, Mich. Bids July 26. CD 6/23.

▲ **Faber Brothers,** 8120 W. McNichols St., Detroit, Mich. and **Midwest Builders,** 17124 Wyoming St., Detroit, Mich. CA Est. $6,000,000. Ridgemont HOMES SUBDIVISION incl. 400 brick homes, Sioux, Columbia, Nathaline Tecumseh, Hemingway and Laverne Sts. REDFORD, MICH. Detroit Mortgage & Realty Co., 333 W. Fort St., Detroit, Mich.

▲ **Merrill-Threm Co.,** 20602 Harper St., Detroit 36, Mich., Owner Builds, $2,750,000. Star Valley Subdivision incl. 200 brick HOMES Star Valley Dr. and 10 Mile Rd., ST. CLAIR SHORES, MICH.

Richman, Coleman & Moss, 8235 Lyndon St., Detroit 38, Mich., Owner Builds, $560,000. Bridemeadows Subdivision incl. 50 or more homes, West Rd. and Allen Rd. section, TRENTON, MICH.

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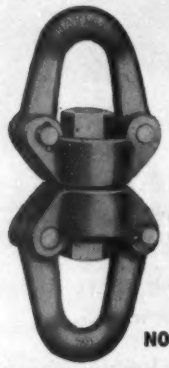

NO. 79

NO. 14B

NO. 91

NO. 51

NO. 79 SWIVEL LINK turns freely and incorporates Ratigans special "safety pin" locking device. 12" overall in length, it has a capacity of 50,000 pounds.

NO. 14-B TRIANGLE "C" LINK has a capacity of 100,000 pounds and provides quick, safe, convenient means of connection. A popular and widely-used link in the heavy construction field.

NO. 91 HOOK is self-locking and can only be opened by hand. Extra strong and durable; made of special heat-treated steel. A 100% safe hook for every type of equipment—utility and chain hoists, cranes, block and tackle, etc. Safety latch automatically locks and cannot be disengaged accidentally. A finger touch releases the lock to open the latch. Capacity 90,000 pounds. Models with or without spring with long, medium or short bail.

NO. 51 UTILITY HOOK . . . rugged, all-purpose, designed for safe, easy handling. Quick-acting, with strong guard to prevent accidental unhooking. Length 12"—15,000 pounds capacity.

J. P. RATIGAN, INC.

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WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲ **Minn., Crystal**—BA 8/30—Village, K. Evans, clk., trunk and lateral sewer sys., Proj. A, 13,784 lin. ft. 8- to 24-in. vitr. clay and rein.-con. sewer pipe, 43 manholes, 134 6-in. service lines, 24 service wyes, special crossings Crystal and Osseo joint trunk sewer and Lombardy Lane, Vera Cruz and Unity Ave. sewer laterals; Proj. B, 7,795 lin. ft. 10- to 36-in. vitr. clay and rein.-con. sewer pipe, 24 manholes, 71 6-in. service lines, 20 service wyes, special crossings, pavement base replacement Bass Lake Rd. West Broadway and Elmhurst Ave. trunk sewers; Proj. C, 6,751 lin. ft. 10 to 36-in. vitr. clay and rein.-con. sewer pipe, 28 manholes, 80 6-in. sewer lines, 3 service wyes, special crossings, Yates Ave., Douglas Drive and 52 Ave., north trunk sewers; Proj. D, 6,925 lin. ft. 8- to 10-in. vitr. clay and rein.-con. sewer pipe, 1,021 lin. ft. 8-in. c.i. pipe, 26 manholes, 94 6-in. service lines, 7 service wyes, special pipe bedding, pavement base replacement and embankment Rockford Rd. trunk sewer West lift station force main and 43 Ave. north lateral sewers; Proj. E, 15,539 lin. ft. 8-in. vitr. clay sewer pipe, 56 manholes, 293 six 8-in. service lines, pavement base replacement 58 Ave., 59 Ave., Shirley Place, Maryland, Nevada, Oregon, Pennsylvania, Quebec, Rhode Island and Sumpter Ave. sewer laterals; Proj. F, 16,360 lin. ft. 8-in. vitr. clay sewer pipe, 51 manholes, 351 6-in. service lines, special pipe bedding 52, Bernard, 51, Corvallis, 50, Fairview, 49, Lakeside, 48, Byron and 47 Ave. sewer laterals; Proj. G, 21,054 lin. ft. 8-in. vitr. clay sewer pipe, 69 manholes, 432 6-in. service lines, pavement base replacement Brunswick, Adair, Zane, Yates, Zenia, Welcome, West Broadway, 46 and 47 Ave. sewer laterals; Proj. J, 13,642 lin. ft. 10- to 18-in. vitr. clay or rein.-con. sewer pipe, 1,710 lin. ft. 6-in. c.i. pipe, 47 manholes, 53 6-in. service lines, special crossing, special pipe bedding, embankment 32 Ave. to Winnetka Ave., trunk sewer Creek trunk sewer to 36 Ave. and South west lift station, force main; Proj. K, west and southwest sewage lift stations, $1,330,000. Plans deposit $50. Pfeifer & Shultz, 702 Wesley Temple Bldg., Minneapolis, engrs.

▲ **Tex., Corpus Christi**—BA 10/11—Lower Nueces River Water Supply Dist., 211 Weber Bldg., Wesley E. Seale Dam Proj. on Nueces River, 5 mi. south of Mathis. incl. two Ambursen type rein.-con. slab-and-buttress spillways 60 ft. high, approx. 1,346 ft. and 1,560 ft. long respectively; three sects. of rolled fill dam approx. 2,200 ft., 500 ft. and 400 ft. long respectively; outlet structure and appurtenant works; field office bldg. est. $15,500,000. Plans deposit $100. Reagan & McCaughan, 320 Wilson Bldg., Corpus Christi and Ambursen Engineering Corp., 295 Madison Ave., New York 17, N. Y. or 603 Rosalie Ave., Houston Zone 6, engr. adv. ENR 8/25. CD 8/11.

BUILDINGS—LB & CA

Minn., New Brighton—SCHOOL—BA 8/26—Bd. Educ., F. C. White, clk., Pinewood Grade School at County Road 1 and Quincy St., (Ramsey Co.), $550,000. Plans deposit $25. M. & G. Buetow, 1931 University Ave., St. Paul, archt. CD 5/18.

Mo., Richmond—HOSPITAL—BA 8/30—Ray Co., hospital, $632,000. J. F. Lauck & Assoc., 6225 Brookside St., Kansas City, Mo., archts. CD 1/12.

▲ **Tex., Killeen**—HOUSING—BA 8/30—U. S. Govt., c/o Purch. & Contrg. Officer, Fort Hood, construct, manage, finance, Wherry Housing Proj. at Gray Air Force Base and Killeen Air Force Base, Est. $1,000,000.

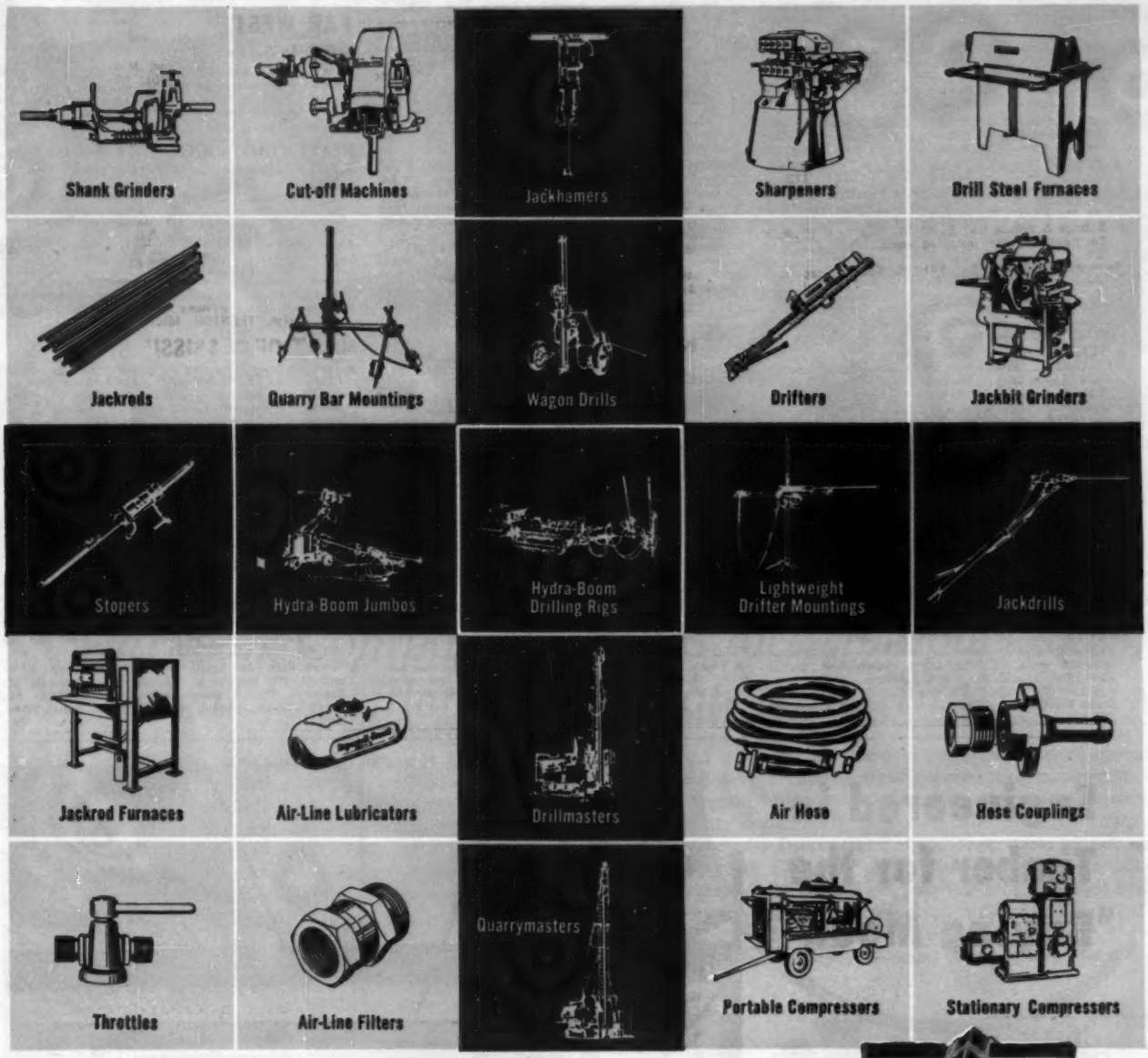
Tex., Liberty—COURT HOUSE ANNEX—BA 8/30—Liberty Co., Court House, court house annex. $500,000. Extended date. Wyatt C. Hedrick, 5201 Fannin St., Houston, engr.-archt. CD 7/25.

BUILDINGS—SLC

Kan., Kansas City—CLUBHOUSE—Mission Hills Country Club, 5301 State Line Rd., Kansas City, Kan., soon lets contract clubhouse and swimming pool, $950,000. Kivett & Myers, 1016 Baltimore St., Kansas City, Mo., archts. CD 9/2.

(Continued on Page 92)

the big PLUS VALUE



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CONDENSERS • PUMPS • OIL & GAS ENGINES

(Continued from page 90)

HEAVY CONSTRUCTION—LB & CA

† **C. F. Bower Constr. Co.,** Nebraska City, Neb., CA $664,337, standard dikes and revetment, Missouri River, Inv. 25-066-56-2. IOWA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids July 22, awarded Aug. 3. CD 7/28 under LB.

† **Pine Bluff Sand & Gravel Co.,** Foot of Nebraska St., Pine Bluff, Ark., LB $465,766. repair standard dikes and revetment, Missouri River, Ponca Bend-Sioux City, Inv. 25-066-56-12. IOWA U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Aug. 5. CD 7/29.

Craighead Electric Co-operative Corp., Jonesboro, Ark., Force Account. $637,000. 111 mi. rural distr. lines and sys. imprvs., Craighead Co. ARKANSAS. CD 6/22.

▲ **KÁNSAS**—Kansas Turnpike Auth., P. O. Box 681, Topeka,

Tecon Paving Co., 1201 Main St., Dallas, Tex. LB $1,460,209. c. conc., Proj. 8-32 and 33-P (1), Douglas Co.; LB $960,621. c. conc., Proj. 8-34-P (1), Douglas and Leavenworth Counties; LB $1,776,921. c. conc., Proj. 9-35 and 36-P (1), Leavenworth Co. Bids Aug. 5. CD 7/22.

TEXAS—State Hy. Comn., Austin,

L. H. Lacy Co., 5630 Yale Blvd., Dallas, Tex., CA $950,803, 0.461 mi. Trinity River Bridge, Hy. US 67 and 77, Proj. UI 288 (6), Dallas Co. Bids July 19. CD 7/25 under LB.

▲ **TEXAS**—State Hy. Comn., Austin,

Tex.—Dodds & Wedegartner, Inc., San Benito, Tex. CA $818,616, grading, structures, flexible base, b. conc. pavement 6.721 mi. US 83, Proj. F 93 (4), etc. Cameron Co.;

Tex.—Collins Constr. Co. of Texas, P. O. Box 1192, Austin, Tex., CA $585,069, widen, grading, structures, foundation course, b. conc. pavement 10.359 mi. Hy. U. S. 90 and 183, Proj. F 79 (4), Caldwell Co.;

Tex.—Gilvin-Terrill, Inc., P. O. Box 2268, Amarillo, Tex. CA $1,254,408, grading, structures, base, b. conc. pavement and T. & R. R.R. overpass 15.718 mi. Hy. U. S. 80, Proj. IW 235 (26), Howard Co. Grand total $2,658,093. Bids July 20. CD 7/26 under LB.

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver,

Pioneer Constr. Co., 2105 Oakland St., Pueblo, Colo., CA $322,325. est. $316,000, grading, stabilization, structures and asphaltic surf. 6.082 mi. Hugo and Wildhorse, Proj. No. F 017-3 (4), Lincoln and Cheyenne Counties. Bids Aug. 4, awarded Aug. 4. CD 7/27.

Harvey Stenmark, 285 S. William St., Denver, Colo., LB $533,800, general constr., 2-story bsmnt. educational television studo, DENVER, COLO., School Dist. No. 1, 414 14th St., Denver, Colo. Jamieson & Williams, 810 12th St., Denver, Colo. engrs.-archts. CD 8/18/54; **Crabb Plumbng Co.,** 1948 12th St., Denver, Colo., LB $99,876, plumbing and heating (Denver, Colo.)

BUILDINGS—LB & CA

Lenci, Lenci & Englund, Virginia, Minn. LB $836,800. general contract, 3 story, 144x194 ft. HOSPITAL addn., VIRGINIA, MINN. City, Hospital Comn., J. R. Richardson, pres., Virginia, Minn. Bids Aug. 2. CD 7/8.

▲ **Hawkeye Lumber & Mill Co.,** c/o D. H. Barry and O. T. Barry II, 98 "F" Ave. N. W., Cedar Rapids, Iowa. Owner Builds, $7,500,000. 250 DWELLINGS, near CEDAR RAPIDS, IOWA.

† **Eckert-Fair Constr. Co.,** National City Bldg., Dallas, Tex., CA, $581,812, 263-man BARRACKS, Inv. No. ENG-34-066-55-110, FORT SILL, OKLA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids June 15. CD 6/22, under LB.

Thomas S. Byrne, Inc., Fort Worth Natl. Bank Bldg., Fort Worth, Tex., CA $830,000. 3-story 75-bed HOSPITAL expans. FORT WORTH, TEX. Osteopathic Hospital, c/o Dr. Phil Russell, Bd. Chmn., 1837 Hillcrest St., Fort Worth, Tex. Bids Aug. 2. CD 8/8, under LB.

Childs Constr. Co., 2716 E. Lancaster St., Fort Worth, Tex., LB $608,106. est. $650,000. 6-story brick, tile, concrete steel OFFICE Bldg., 6200 Camp Bowie Blvd., FORT WORTH, TEX. Rowan Drilling Co., Fair Bldg., Fort Worth, Tex. Bids June 30. CD 7/11, under LB.

▲ **El Dorado Lumber & Building Corp.,** c/o Jack Perry, 1110 Prospect St., Houston, Tex., Own Forces. $410,000. 50 DWELLINGS; $375,000, 40 DWELLINGS; $381,750, 44 DWELLINGS, Grand total $1,166,750, HOUSTON, TEX. CD 6/20.

Paul Canto, Builder, 1423 Thornton St., Houston, Tex. CA $350,000. 26 DWELLINGS; CA $378,400, 30 dwellings, HOUSTON, TEX. Paul Canto, 1423 Thornton St., Houston, Tex. CD 6/6.

▲ **R. E. Baldwin & Assocs.,** 1011 Howard Lane, Houston, Tex., Owner Builds. $382,750, (A) 20 DWELLINGS; $366,195, (B) 16 dwellings; $416,750 (C) 30 dwellings. Grand total $1,165,695. HOUSTON, TEX. CD 7/13.

O. R. Winter, Builder, 2406 S. MacGregor St., Houston, Tex. CA $360,000, 30 DWELLINGS; CA $372,522, 33 dwellings, JACINTO CITY, TEX. J. B. Belin, State-Wide Lumber Co., 4120 Lyons St. and O. R. Winter, Developer-Builders, 2406 S. MacGregor St., Houston, Tex. CD 6/6.

▲ **E & R Lumber Co.,** 2726 Texas Ave., Lubbock, Tex. Owner Builds. $349,175 (A) 30 DWELLINGS; $377,610, (B) 38 dwellings; $369,050, (E) 33 dwellings, Grand total $1,095,835. LUBBOCK, TEX. CD 6/6.

▲ † **Geo. A. Rutherford, Inc.,** Box 771, Albuquerque, N. M. LB $1,556,499. 46,500 sq. ft. rein.-con., masonry, HOSPITAL addn., Sanda Base, Eng. 29-005-56-6, ALBUQUERQUE, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. Bids July 28. CD 7/19.

▲ **L. M. Mauldin,** 1441 Columbia Dr., N.E., Albuquerque, N. M., Owner Builds, $1,500,000. 42x413 ft., masonry, 90,000 sq. ft. SHOPPING CENTER, ALBUQUERQUE, N. M. Wm. E. Burk Jr., 512 Yale Ave. S.E., Albuquerque, N. M., archt.

FAR WEST

BUILDINGS—BA

▲ **Wash., Puyallup**—HIGH SCHOOL—BA 8/30—School Dist. 3, Puyallup, 84,000 sq. ft. steel frame junior high school with hot water heating. $1,000,000. Plans deposit $25. R. B. Price, 2907A St., Tacoma, archt. CD 11/15/54.

HEAVY CONSTRUCTION—LB & CA

Guy F. Atkinson Co., Box 259, Long Beach, Calif., LB, $765,476, wharf at Pier B, Berths 12 and 13, Long Beach Middle Harbor, LONG BEACH, CALIF. Long Beach Harbor Dpt., 1333 El Embarkadero, Long Beach, Calif. Bids Aug. 4. CD 7/21.

▲ **Johnson-Western Constr. Co. and E. A. Irish,** 2100 W. Wilmington-San Pedro Rd., San Pedro, Calif., CA, $1,119,662, est. $750,000. Proj. 10, Normandie storm drain, Gardena, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids July 22, awarded Aug. 2. CD 7/27, under LB.

BUILDINGS—LB & CA

▲ **Ford J. Twaits Co.,** 449 S. Beaudry St., Los Angeles, Calif., CA $2,096,000. 3 and 4 story rein.-con. HOSPITAL, ARCADIA, CALIF. Hospital Foundation of the Methodist Church, 2826 S. Hope St., Los Angeles, Calif. Bids July 27. CD 8/2, under LB.

C & R Constr. Co. Inc., 3719 N. Huntington Dr., Pasadena, Calif., CA, $479,970. 32 frame, stucco DWELLINGS, Tracts 21122 and Tract 18820 ARCADIA, CALIF. Arcadia Acres, 3719 N. Huntington Dr., Pasadena, Calif.

▲ **C. W. Driver, Inc.,** 2618 Temple St., Los Angeles, Calif., CA $1,020,000. AUDITORIUM and Burbank High School addn., BURBANK, CALIF. Burbank Unified School Dist., 245 E. Magnolia St., Burbank, Calif. Bids July 28. CD 8/2.

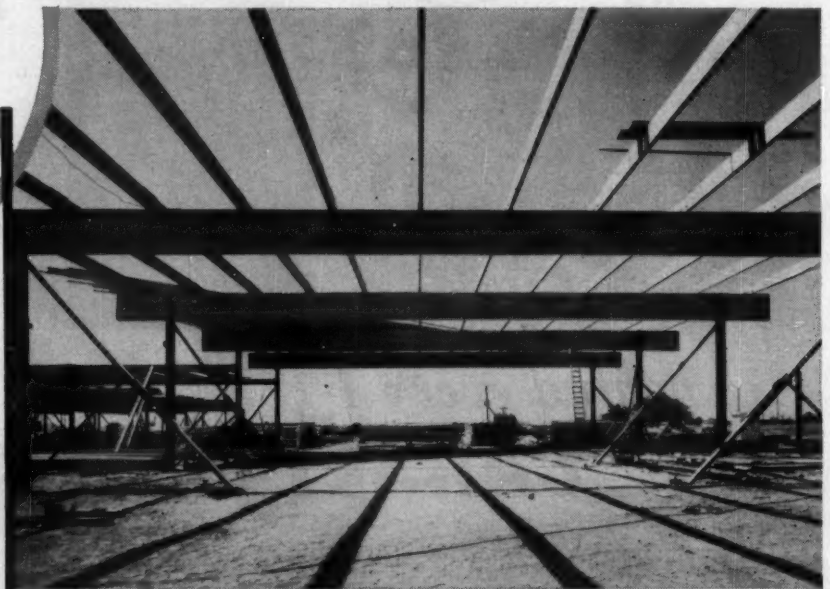
▲ **H. B. Nicholson,** 880 E. Colorado St., Pasadena, Calif. CA $2,211,000. est. $2,000,000. Junior HIGH SCHOOL, 220 St. and Moneta Ave., Wilmington, LOS ANGELES, CALIF. Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids July 15, awarded Aug. 2. CD 6/21.

▲ **Belair Park** (Gus Sousa, G. A. Cianciarula and E. W. McGah), c/o Beckett & Federighi, 1441 Franklin St., Oakland, Calif., Own Forces, $8,000,000. 500 HOUSES, and shopping center in North Napa, NAPA, Calif.

Engineered in Timber for the "Buying Mood"

This ultra modern shopping center is typical of the results being achieved by designing in engineered timber. Permanent and maintenance-free, the heavy glulam beams by Timber Structures, Inc. bring unexcelled economy while adding a friendly, natural appearance that creates a pleasant atmosphere conducive to the "buying mood".

Hundreds of effective store buildings throughout the country feature structural framing of engineered timber arches, beams and trusses by Timber Structures, Inc. Details of these units are contained in the authoritative catalog, "Engineered Timbers", a copy of which is yours upon request. Get it from your nearest Timber Structures office, or write us direct.



Palo Shopping Center, San Jose, California, has center bay of 60-foot span with lower bays at either side. Clerestory windows are placed beneath overhanging roof of center bay. Architect: Victor Gruen & Associates, San Francisco and New York. Lew Jones Construction Co. of San Francisco was general contractor.

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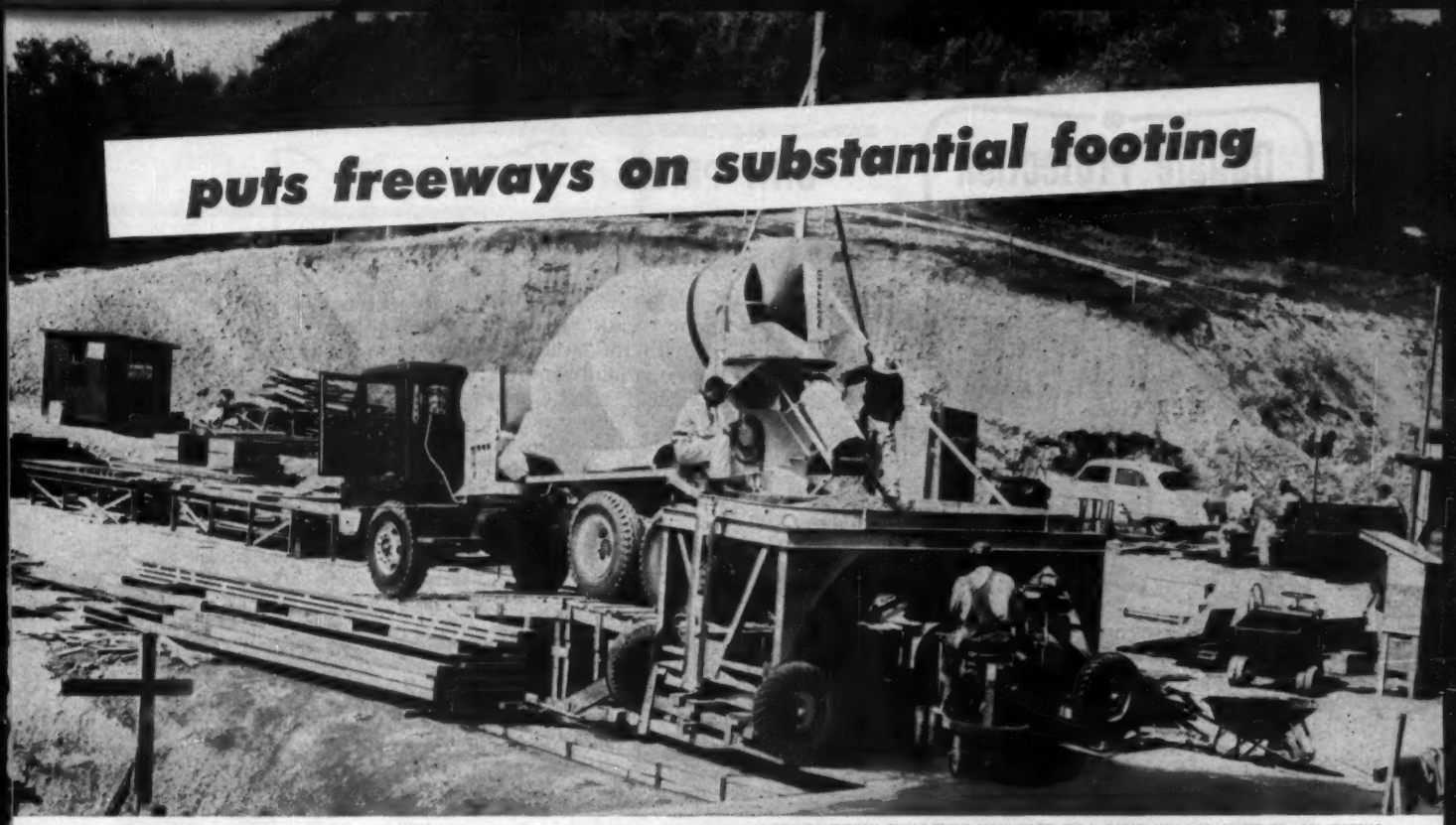


PHOTO COURTESY CHALLENGE MANUFACTURING COMPANY, LOS ANGELES, CALIFORNIA

Chrysler Compact Power and drive package ideal for sidemounting on transit mixer

Working hard to keep pace with its growing population, the State of California is underway with a substantial highway program. Great limited-access arteries are already carrying millions of vehicles past populous points and more "freeways" are in the making.

Here pictured in construction is an overpass on one section of the Southern California Freeway. A Challenge Transit Mix Pacemaker is pouring concrete into a collecting hopper. The hopper in turn will empty the mix into a power buggy which will carry it to the forms.

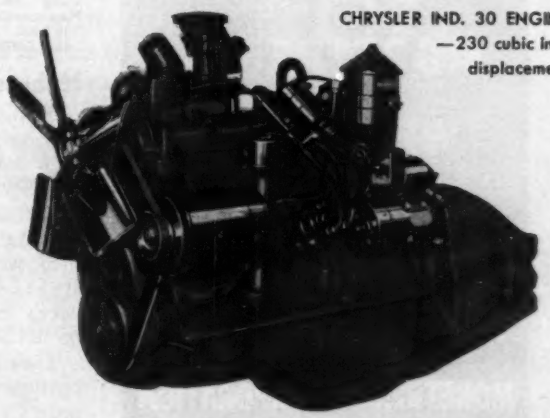
Probably neither the operator nor the contractor has given the ramp the truck is backed up onto a second thought —nor should they. Twelve-degree inclines are not unusual for modern-day transit mixers. Mixer manufacturers build and power their units to give maximum performance under every conceivable condition. That's why Challenge Manufacturing Company powers the bulk of its highly-regarded transit mixers with Chrysler Industrial Engines. Then too because of their light weight, compact construction, Chrysler Industrial Engines are "made to order" for Challenge sidemount construction. Engine, drive and transmission are on the side of the truck bed alongside the drum.

The 6½ cubic yard capacity mixer pictured uses the 230 cubic inch displacement Chrysler Ind. 30 Engine equipped with Chrysler gyrol Fluid Coupling. This "package" is a standard feature of Challenge Mixers. The result is a power-packed combination with built-in protection against the wear and tear of daily use and possible inexpert operation.

Important manufacturers of construction equipment have found it good business to offer their customers dependable equipment, dependably powered. For most of them that means Chrysler Industrial Power. They have found, as you will too, that Chrysler production-line methods adapted to specialized industrial engine building provide custom-built engines at mass-production prices.

See a Chrysler Industrial Engine Dealer or write:

Dept. 98, Industrial Engine Division, Chrysler Corp., Trenton, Mich.

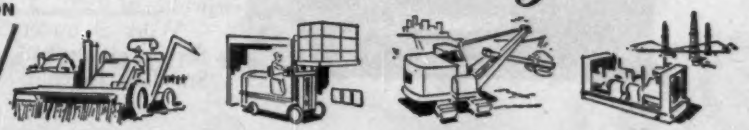


CHRYSLER IND. 30 ENGINE
—230 cubic inch displacement

CHRYSLER *Industrial Engines*

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

HORSEPOWER WITH A PEDIGREE



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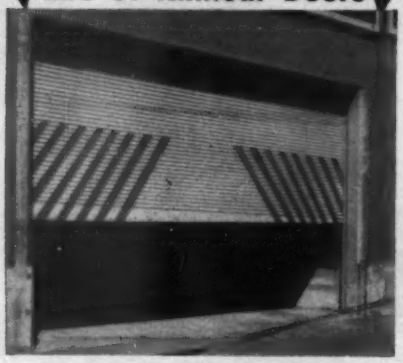
Double Protection
Heavy Galvanizing Plus Kinnear Paint Bond Adds To Amazing Long Life of Kinnear Doors



Kinnear Steel Rolling Doors are doubly protected against the elements —*before they receive prime and finish coats of paint in the field.* A heavy coating of 1.25 ounces of zinc per square foot (ASTM standards) provides lasting weather-resistance. And Kinnear's Paint Bond — a special phosphate treatment — assures *thorough* paint coverage. These rugged space-saving doors are a world-wide favorite for low-cost protection! Send for details.

The KINNEAR Manufacturing Company
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Saving Ways in Doorways

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UNIT PRICES

Oahe Dam Outlet

Stage IV of the Oahe Reservoir Project, near Pierre, South Dakota, drew five bidders with the award, at $4,631,805, to the Foley joint venture. Work is for the Omaha District Corps of Engineers.

The contract calls for the construction of six control substructures, including tunnel transitions, to a depth of about 200 feet.

Minimum hourly wage rates include: air tool operator (jackhammer vibrator) $1.35, carpenters $2.275, ironworkers, structural and reinforcing $2.675, general laborers $1.30, shovel, crane, 3½ yd and over $2.38, shovel, crane, 3½ yd and under $2.23, dozer $2.10, truck drivers, 1½ to 5 ton $1.30, and over 5 ton (Euclid) $1.65.

Bidders include:

1C	Foley Bros., Inc., St. Paul, Winston Brothers Constr. Co., Minneapolis, C. F. Lytle Co., Sioux City, Donovan Constr. Co., St. Paul, Missouri Valley Construction Co., Leavenworth, Kans.	$4,631,805
2	Al Johnson Const. Co. Minneapolis, Minn.	4,751,843
5	M. J. Boyle & Co., Chicago, Ill.	5,969,198
EE	Corps of Engineers, Omaha, Nebr., (without profit)	4,170,093

Completion 12-31-57

Bids: 8-8-55 Items	Unit	Quantity	Unit Prices 1C	2
Excavation	cy	80,000	$15.50	$7.96
Concrete in shaft	cy	26,200	26.00	26.90
Conc in water passage	cy	26,500	31.00	39.30
Portland cement	bbl	66,000	4.27	6.23
Steel reinforcement	lb	6,400,000	0.11	0.15
Structural steel	lb	2,006,000	0.18	0.23
Miscellaneous metal	lb	525,500	0.45	0.38
Mine ties	lf	91,000	0.56	0.64
Wire mesh to 74,500	lb	74,500	0.24	0.36
Wire mesh over 74,500	lb	7,800	0.16	0.36
Steel waterstops	lf	27,150	2.00	2.40
Rubber waterstops	lf	1,240	6.20	5.15
Piezometer & pond line systems	ls	.....	15,000	.....
Pneum-placed mortar to 4,800	sack	4,800	9.60	6.30
over 4,800	sack	5,000	4.50	6.30
Drilling grout holes	lf	18,000	1.10	2.78
Grout pipe	lb	42,300	0.78	0.45
Portland cmt in consolid grt, to 1,200	cf	1,200	2.00	1.50
over 1,200	cf	4,800	1.40	1.53
Place consolid grt to 2,200	cf	2,200	10.00	2.25
over 2,200	cf	8,800	0.70	2.30

Nebraska Soil Conservation

Two detention dams and one stabilization dam in Gage County, Neb., drew four bids to the Soil Conservation Service. A detention dam 2 miles north of Pickrell, Neb., to retard floodwaters on Indian Creek watershed, went to Boeve Construction Co at $12,345, $2,449 below the engineer's estimate. This structure is to be 1,120 by 30 ft, top width 12 ft.

Tom J. Helean, will construct a detention dam and stabilization dam near Cortland under a total $9,531 contract. The 700x22-ft detention dam will have a top width of 11 ft; the 450x23-ft stabilization dam, a top width of 9 ft.

Work is under Soil Conservation Service watershed engineer L. E. Smedley, Lincoln, Neb.

Wage rates include: air tool operators $1.25 per hr; labor unskilled $1.15, concrete $1.25; operators, clamshell and dragline and shovel $2.00, motor grader $1.85, tractor, farm $1.25, tractor 55 hp and less $1.50 over 55 hp $1.85, bulldozer $1.85; truck driver, under 5-ton $1.25, over 5-ton $1.50.

Concrete is to be class B, 3,000 psi strength in 28-day test.

Bidders include:

Detention dam 15A near Pickrell

1C	Boeve Construction Co., Sterling, Neb.	$12,345
2	Tom J. Helean, Hanover, Kansas	12,934
4	Drake Bros & Schwisow, Western, Nebraska	13,330
EE	Soil Conservation Service, Lincoln, Neb.	14,794

Completion: 115 days; liquidated damages $25.00 per day

Bids: 6-27-55 Items	Units	Quantity	Unit Prices 1C	2
Concrete, class B	cy	34.1	$40.50	$40.00
Reinforcing steel	lb	1,733	0.15	0.15
Structural steel	lb	330	0.20	0.20
Embankment, class 2	cy	35,000	0.198	0.22
Principal spillway, 24" ϕ std str conc culv P	lf	126	9.90	10.00
Welded stl P, 8" ϕ 14-ga.	lf	82	2.25	2.00
Gate vlv 8" ϕ, w/valve stem extension	ea	1	175.00	158.00
Inlet filter house of 36" ϕ 12-ga CMP	ea	1	140.00	75.00
Gravel fndn drains with 6" ϕ CMP	lf	450	2.25	2.00
New fence, type 2	lf	1,230	0.34	0.38
3	lf	1,000	0.37	0.40
Watercourse	lf	260	0.60	0.05
Excavation common	cy	200	0.20	0.50

Detention & stabilization dams near Cortland

1C	Tom J. Helean, Hanover, Kansas	$9,531
2	Boeve Construction Co., Sterling, Neb.	10,333
4	Kiester-Walker Const. Co., Geneva, Neb.	11,622
EE	Soil Conservation Service, Lincoln, Neb.	9,846

Completion: 90 days; liquidated damages $25.00 per day

Bids: 8-23-55 Items	Unit	Quantity	Unit Prices 1C	2
Detention dam 6C:			$6,398	$7,054
Concrete, class B	cy	35.3	40.00	45.00
Reinforcing steel	lb	2,217	0.15	0.20
Structural steel	lb	570	0.20	0.20
Embankment, class 2	cy	10,050	0.22	0.218
Principal spillway, 24" ϕ std str conc culv P	lf	96	10.00	11.90
Gate vlv 10" ϕ with stem extension	ea	1	300.00	300.00
Welded stl P 10" ϕ, 14-ga.	lf	33	3.00	4.25
Perf CMP 36" ϕ inlet, filter house	ea	1	150.00	152.00
New fence, type 1	lf	2,050	0.38	0.33
Excavation, common	cy	200	0.20	1.00
Stabilization dam 6-10:			3,134	3,279
Concrete, class B	cy	1.95	50.00	55.00
Reinforcing steel	lb	52	0.15	0.20
Structural steel	lb	429	0.20	0.20
CMP riser 30" ϕ, 14-ga, 8'	ea	1	90.00	88.00
Principal spillway, 24" ϕ 14-ga CMP	lf	84	8.00	9.00
Std met diaphragms 14-ga for 24" CMP	ea	3	90.00	125.00
Embankment, class 2 in dam, wing dike, core tr.	cy	5,510	0.22	0.22
Lumber, creosote treated	fmb	42	0.50	1.00
New fence, type 1	lf	1,505	0.45	0.40

Correction: Barnhart Island Power Plant, U. S. Side

A type slip in the June 30, 1955 issue of ENR resulted in scrambling some of the contract unit prices. Near the bottom of the middle column these five corrections should be noted, p. 70.

Items	Contract as printed	Price corrected
Built-up roofg, vapor barrier & insulation	$0.00	$0.58
Foamglass insulation	0.58	0.29
Insulated alum panels	1.29	1.93
Alum, orn & misc. spandrel & col trm	3.93 55,010	3.10 55,000

- Steering Collar Insulator
- Radiator Hose
- Heater Hose
- Body Insulators
- Heater Can Anti-Squeak Pad
- Steering Post Bracket Insulator
- Spark Plug Covers
- Steering Post Pads
- Radiator Drain Tube
- Silent Block Bushing
- Tail Pipe Insulator Support
- Wiper Hose
- Antenna Gaskets
- Division Channel Weatherstrip
- Window Channel Filler Seal
- Parking Light Lens Gaskets
- Bumper to Fender Spacer
- Fresh Air Adapter Grommets
- Battery Drain Tubes
- Gearshift Lever Arm Bushing
- Replacement Tubes
- Frame & Axle Bumpers
- Spring Shackle Bushings
- Fender & Engine Compartment Dust Shield
- Steering Wheel Spoke Ornament Cushion
- Instrument Panel Anti-Squeaks, Wiring Grommets
- Windshield Wiper Pivot Pad & Bracket Grommet
- Rear Window Weatherstrips
- Horn Ring Ornament Cushion
- Dash Liner & Cowl Trim Pads
- Door Check Arm Bumpers
- Stone Deflector Bumper
- Sound Deadener Insulation
- Tubeless Tires
- Wiring Clips
- Body Shims
- Headlight Lens Gaskets
- Radiator to Hood Seals
- Tail & Stop Lamp Lens Pads
- Radiator Seals
- Hood Lacing
- Fender Seals
- Hood Bumpers
- Bumper Grommet
- Glove Box Door Bumpers
- Gas Tank Filler Neck Grommet
- Sill Mats & Attaching Grommets
- Defroster Hose
- Door Bumpers

super-durable Enjay Butyl protects '55 cars in over 100 places

It's good news for car owners that the rubber parts that used to crack, chip, and practically disintegrate under tough road and weather conditions are being replaced with parts made from super-durable Enjay Butyl. In over 100 vital places, Enjay Butyl helps give many '55 models the performance and appearance that make them a pleasure to drive, an economical unit to maintain.

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AEC Approves Two Big A-Plant Projects

Commission OK's proposed plants at Chicago and Detroit, rejects two other applications; no word yet on Con Ed

The Atomic Energy Commission last week OK'd plans of two private groups to build large-scale experimental nuclear power plants—and rejected two others. All four proposals were submitted to AEC earlier this year as part of its power demonstration reactor program (ENR Apr. 14, p. 110).

AEC will license:

- The 180,000-kw plant proposed by the Nuclear Power Group, which is lead by Commonwealth Edison Co. of Chicago. There are six other utilities in this group, plus Bechtel Corp., of San Francisco.
- The 100,000-kw plant planned by the Detroit Edison Group, headed by Detroit Edison Co. with 10 other utility companies.

AEC found that two other projects do not offer "acceptable bases for negotiation." These were:

- A 100,000-kw project by Yankee Atomic Electric Co., formed by 12 New England utilities.
- A 75,000-kw reactor proposed by Consumers Public Power District, of Columbus, Neb.

• **Why?**—Just why AEC turned down the Yankee Atomic and Consumers Power proposals is not known. Reports are that both plans involved substantial capital grants from the government. The door is still open for further proposals from both parties. Discussions are proceeding this week.

• **No sign**—Meanwhile, AEC gave no sign as to when it would act on the proposal of Consolidated Edison Co. of New York to build the biggest A-plant of all so far—a 236,000-kw plant near Peekskill, N. Y. Con Ed submitted its application for a license before any of the others.

• **Chicago reactor**—Both the Nuclear Power Group and the Detroit Edison Group plan to build their plants without capital grants from AEC. General Electric Co. already has a $45-million lump-sum contract to build the plant for NPG at the junction of the Kankakee and Des Plaines Rivers, about 44 mi southwest of Chicago. GE will design and supply equipment. Bechtel Corp. will design and build the plant as subcontractor. Of the cost, $30 million will be put up by Commonwealth Edison, which will own the plant. The other members will put up $15 million in return for experience. On this basis, the plant would cost $250 per installed kw.

• **Detroit reactor**—The Detroit Edison Group will build at Monroe, Mich. So far, a contractor has not been named. The members will own their plant jointly, with Detroit Edison buying the steam from the group. Estimated cost is $45 million, or $450 per installed kw.

• **Different approaches**—The NPG and Detroit Edison reactors involve different principles. The first one—which will be Commonwealth Edison's Dresden station—is a dual-cycle boiling water reactor. Its designers believe it has two major advantages over previous models. These advantages are: (1) There is no heat exchanger. (2) The system has a self-compensating safety factor. Against this is the disadvantage that radioactive water reaches the turbine, which means the turbine must be leak-proof.

The Detroit reactor uses a very different approach. It is a breeder, creating more fuel than it uses up. In this reactor, the neutrons produced by fission of U-235 atoms convert the U-238 atoms that are also present to plutonium, which itself is a fine atomic fuel. More of these plutonium atoms would be produced than are consumed. The extra plutonium would be removed periodically from the reactor for use as fuel or in weapons.

In the Detroit reactor, the heat produced by fission would be carried by liquid sodium to a heat exchanger. The molten metal would pass through this water-filled heat exchanger in a closed circuit, turning water into steam for the turbogenerator.

Fast In-Flow of Proposed Work Is Healthy Base for the Boom

New proposed work flowed into ENR's backlog at a healthy rate during July, providing a solid basis for the future of the construction boom. ENR reported projects estimated to cost nearly $1.6 billion as proposed last month. This pushes the total backlog of jobs in the planning stage to a new high of nearly $86 billion.

During the first seven months of this year, total value of proposed projects reached a record $12.6 billion. This is 37% over last year—a very encouraging volume of planning that is good news for future contracts.

• **State and municipal**—Sparking the rise so far this year is state and municipal work. This also is a bullish sign, since volume of contracts awarded this year is not up anywhere near as much over 1954 as private contracts. About $873 million in state and municipal projects were proposed during July. That brings the total state and local work proposed for the first seven months to a record $6.7 billion, about 67% above the same 1954 period.

Federal work also is flowing into the backlog much faster than last year. The seven-month total is $314 million, up 25%.

• **Private projects**—Private projects also are coming in faster than last year, though not at the smart pace set by public works. In July, private jobs estimated to cost $622 million were proposed. That brings the seven-month total to $5.6 billion, 14% ahead of last year.

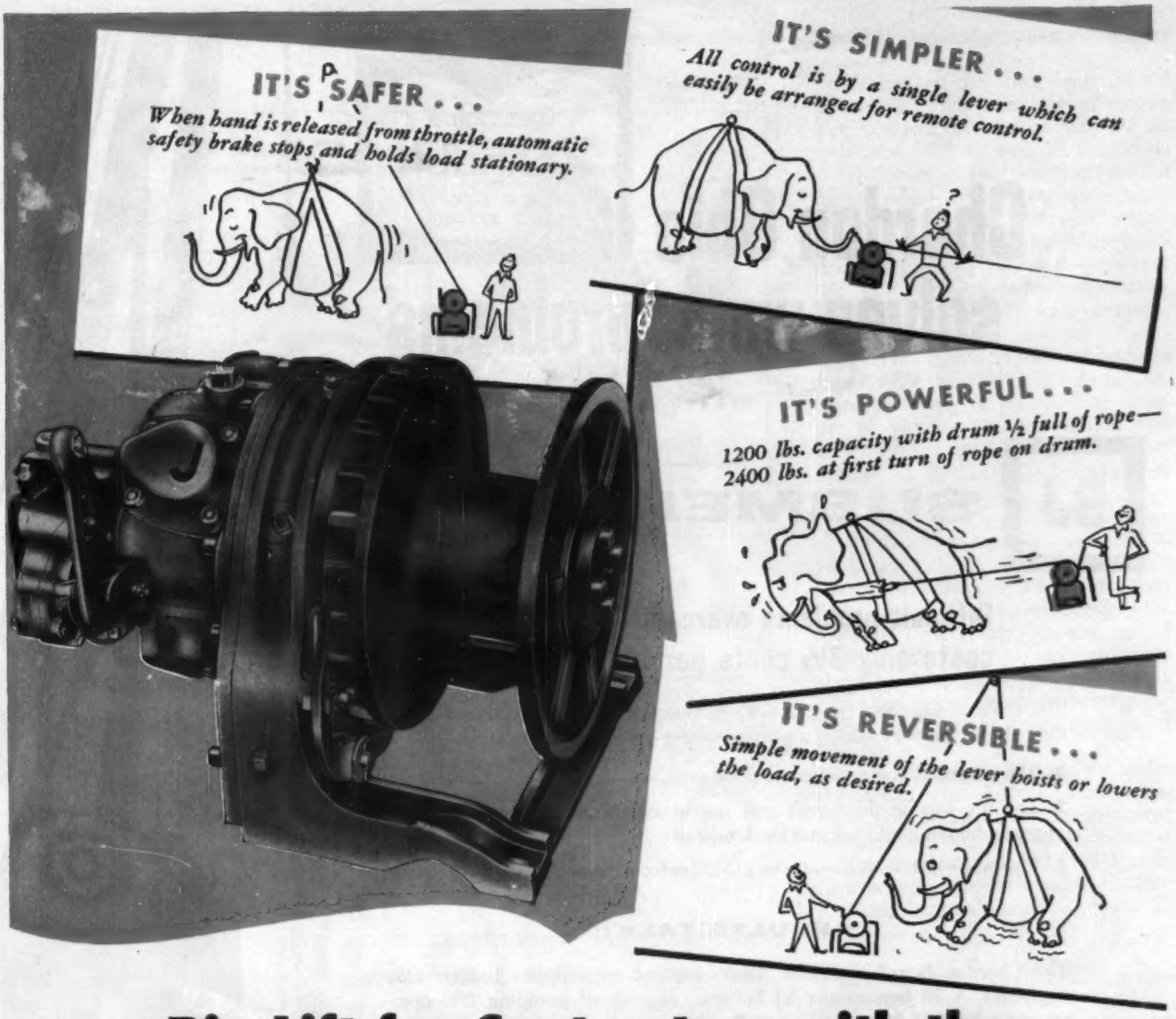
The total backlog of private work is $35.4 billion, up 7% since the start of the year. In other words, it has gained in spite of a record volume of projects moving into the contract stage.

Cement Troubles in Canada: Shortages Mostly in the West

Canada is having its troubles with cement shortages, too. With a record building year, there are spot shortages, mainly in western Canada. The worst shortages are being felt in Manitoba, Saskatchewan, and Alberta, where imports of U. S. and some European cement are helping out in some sections. Manitoba oil fields are using a carload a day.

• **Hudson Bay**—The cross-Atlantic shipments arrive by way of Fort Churchill on Hudson Bay. This is a short route that is practical in summer. Conditions in Manitoba are expected to improve in the fall, when a new cement plant at Fort Whyte gets into peak production.

(*B&F continued on page 99*)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1200 lbs. capacity with drum ½ full of rope—
2400 lbs. at first turn of rope on drum.
IT'S REVERSIBLE . . .
Simple movement of the lever hoists or lowers the load, as desired.

Big Lift for Contractors with the JOY DW-III "PISTONAIR" HOIST

The JOY DW-111 "Pistonair" is a powerful, versatile single drum hoist powered by a 4 cylinder, 4 H.P. compressed air motor.

The automatic safety brake is actuated by simply returning the throttle lever to the "off" position. An additional safety factor is the spring return of the throttle lever. If the operator's hand were to slip off the throttle, the lever would instantly spring to "off," actuate the safety brake, and stop and hold the load in any position.

Power plant and gearing mechanism of the DW-111 are totally enclosed. The safety brake is inside the drum, safe from dirt or dripping water.

These and many other features make the Joy DW-111 the *best* single drum hoist of its class on the market. You will agree after you test its power, versatility and accident-preventing safety brake. ● Write for Bulletin 76-X. **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

WAD C-5744

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CONSTRUCTION EQUIPMENT MANUFACTURERS FOR OVER HALF A CENTURY

Chardon, Ohio solves water problems

WITH A

BJ SUBMERSIBLE

Difficult problems overcome—yet water costs only 3½ cents per 1000 gallons!

The town of Chardon (pop. 2,478) in Gauga County, Ohio, faced these difficult problems in solving a primary water supply pump selection:

1. The proposed pump site was a flood area.
2. The site was on the town's golf course where unsightly structures or pump houses could not mar the landscape.
3. The pump installation would be 1½ miles from the overhead water tower.

RESULTS TALK!

The Chardon Board of Public Affairs worked with Byron Jackson Co. engineers. A 30 horsepower BJ Subette, capable of pumping 250 gpm against a head of 360 ft., was installed in a simply-constructed pit in the marshy area. Unseen and completely submerged, this single Subette pumps one-half of the town's water supply. It eliminated the need for an unwanted and expensive pump house and solved the dangers of flood-out during high water periods. In addition to solving these difficult installation requirements, the BJ Subette is pumping water at an operating cost of only 3½ cents per 1000 gallons!

The BJ Subette answers primary water supply and booster pumping needs of the smaller municipal user. For larger cities, BJ Submersible models are available in capacities to 20,000 gpm and heads to 1800 ft. **Write for complete information**

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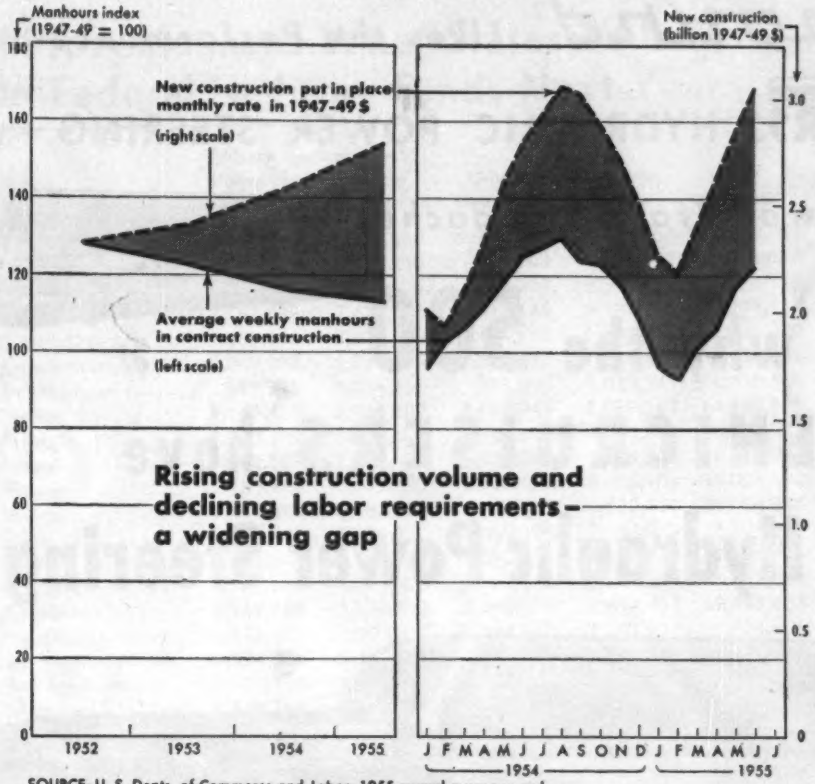

SOURCE: U. S. Depts. of Commerce and Labor; 1955 annual averages and June 1955 manhours index estimated by McGraw-Hill Dept. of Economics

THE LONGER LOOK:

Contract employment in construction keeps declining, while construction volume rises. What's going on?

Construction employment has not been keeping pace with the steady year-to-year climb in construction volume. In fact, government figures show that since 1952 a mounting volume of construction has been put in place by fewer workers each year. Average contractor employment fell 4% from 1952 to 1954, and it is down again this year.

The drop in contract construction labor requirements is even more striking when put in terms of manhours—employment multiplied by average number of hours worked (chart, above). This is because the average workweek has been declining, too. In 1954 almost 10% fewer manhours were worked in contract construction than in 1952. But meanwhile the volume of construction (after allowing for cost increases) jumped 12%.

• **ENR saw it**—ENR called attention to this growing discrepancy early this year in its Annual Report and Forecast issue (Feb. 17, p. 60). It suggested then that part of the gap might be caused by a rise in manhour productivity. Obviously, this could be only a partial answer. Anyone who believes that productivity is the whole answer would have to assume a staggering increase of some 10% a year in productivity between 1952 and 1954.

The government agencies responsible for official construction statistics (the Departments of Commerce and Labor) caution that the figures on construction put in place and contract emloyment may also be diverging for other reasons. The March issue of Construction Review, published by these departments, lists several additional reasons that help explain the gap:

(1) Force-account construction goes into the figures on new work put in place, but of course force-account labor is not included in the contract employment figure. So a big increase in new construction by a chemical company or some government agency using its own work force would not show up in the employment series.

(2) Repair and maintenance expenditures, on the other hand, do not go into the new construction figures. Yet construction contractors do an estimated 30% to 40% of this work.

(3) Errors in the new construction figures, which are only estimates based on an assortment of sources of widely varying accuracy, can be fairly large. And the "phasing" of big projects over the months that work presumably takes place is based in some instances on prewar patterns.

(4) The construction cost indexes used to deflate the current dollar estimates cannot give an accurate measure of physical volume of construction, as they are based primarily on prices and do not reflect changes in design and methods.

(5) The "mix" of different types of construction changes from year to year, some types requiring far less labor for the same dollar volume than other types. In private residential building, for example, one manyear of work is estimated to represent only about $13,000 of construction volume, while a manyear on atomic energy installations accounts for an average of $20,000.

(6) The employment estimates themselves can produce inconsistencies. For instance, some contractors operate in other business activities as well as construction, and employes in such activities are included in the employment reports along with those in actual construction jobs.

• **Revised figures**—Revisions announced a few weeks ago by the U. S. Bureau of Labor Statistics point up still another possibility for error in the employment figures. The monthly estimates are based on reports from a large sample of employers, but periodically BLS revises the figures to tie them in with Social Security tax reports. The latest revision—using the first quarter of 1954 as a "benchmark"—resulted in lower estimates of contract employment for most of 1953 and all of 1954.

Most of the decline shown in the revised employment series between 1952 and 1954—100,000 out of a total 107,000—was reported for general building contractors.

• **Productivity gain is clear**—Despite all these chinks in the statistics, the basic trends of rising construction volume and falling labor requirements are clear. Inadequate figures make it impossible to tell how great the gain in productivity is, but contractors are showing year after year that they can do more work with fewer employes.

(*B&F continued on page 101*)

Greyhound Likes the Performance of VICKERS® HYDRAULIC POWER STEERING on 700 Highway Traveler Coaches

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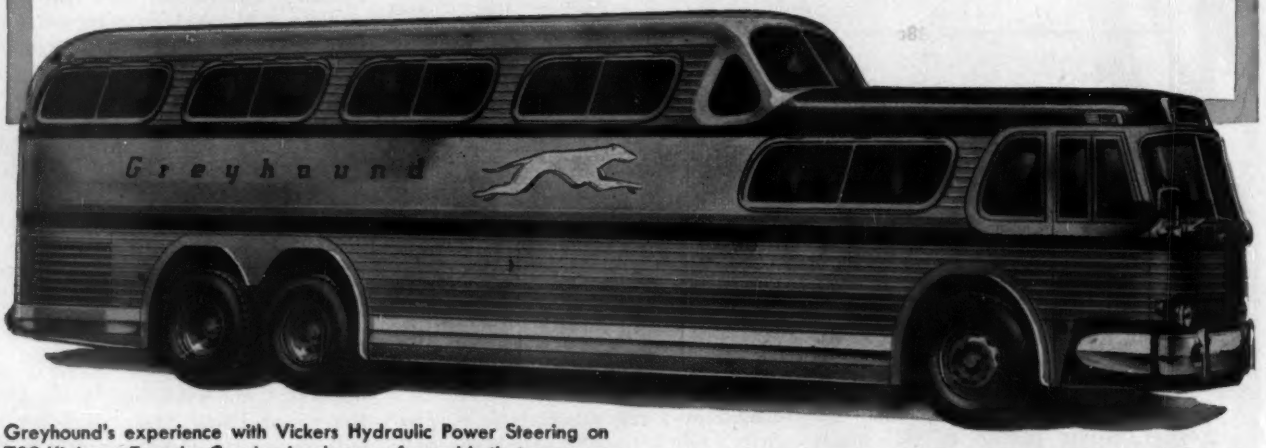

Greyhound's experience with Vickers Hydraulic Power Steering on 700 Highway Traveler Coaches has been so favorable that management selected Vickers Steering for the 500 new Scenicruisers . . . the spectacular new coaches (Model PD-4501) that are opening a new era in highway travel.

Greyhound officials report that Vickers Hydraulic Power Steering helps provide maximum safety and smoothness of operation. "Finger-touch" control eases the driver's job . . . he stays fresh, alert, efficient. The power mechanism automatically absorbs front wheel shock from obstructions . . . there can be no kick-back at the steering wheel. Extra steering power and quick maneuverability are always available for emergency conditions.

Vickers Hydraulic Power Steering is easily applicable to new and existing vehicle designs . . . usually with very minor alteration. For additional information, ask for Bulletin M-5106.

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VICKERS® Hydraulic Power Has Been Steering Motor Vehicles for More Than 25 Years

Vickers Hydraulic Power Steering Booster does the actual work of steering.

Engine-driven Vickers Vane Pump (with integral volume control and relief valves, and oil reservoir) supplies power for steering.

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

BPR Announces What States Will Get In Federal Highway Funds Next Year

State	Primary highway system	Secondary or feeder roads	Urban highways	Interstate System	Total
Alabama	$6,717,934	$5,209,834	$2,272,219	$3,534,866	$17,734,853
Arizona	4,746,473	3,232,256	674,603	1,975,320	10,628,652
Arkansas	5,272,837	4,219,878	970,219	2,507,179	12,970,113
California	14,521,798	7,475,335	15,417,145	9,792,836	47,207,114
Colorado	5,689,666	3,800,399	1,441,432	2,307,752	13,239,249
Connecticut	2,048,002	1,034,250	3,358,925	1,659,495	8,100,672
Delaware	1,551,375	1,034,250	355,693	1,077,343	4,018,661
Florida	5,146,468	3,364,307	3,109,943	2,939,167	14,559,885
Georgia	7,803,345	5,962,692	2,527,598	4,045,342	20,338,977
Idaho	3,902,559	2,744,957	333,787	1,738,744	8,720,047
Illinois	12,163,280	6,619,637	12,129,168	8,116,903	39,028,588
Indiana	7,489,629	5,163,108	4,149,253	4,222,758	21,024,748
Iowa	7,621,742	5,579,210	2,059,014	3,548,249	18,808,215
Kansas	7,655,644	5,360,767	1,630,111	3,170,269	17,816,791
Kentucky	5,861,614	4,861,975	1,801,096	3,232,347	15,757,032
Louisiana	4,942,280	3,576,617	2,542,360	2,634,407	13,895,664
Maine	2,657,051	1,901,353	724,853	1,391,238	6,674,495
Maryland	2,794,386	1,708,629	2,943,514	2,049,815	9,496,344
Massachusetts	3,994,174	1,475,320	7,218,797	3,656,939	16,345,230
Michigan	9,858,361	6,017,283	8,072,113	6,205,304	30,153,061
Minnesota	8,325,596	5,872,583	2,824,202	3,941,091	20,963,472
Mississippi	5,646,870	4,703,728	960,232	2,757,388	14,070,018
Missouri	9,228,984	6,244,187	4,271,268	4,719,780	24,464,219
Montana	6,338,148	4,360,394	408,398	2,419,567	13,526,507
Nebraska	6,127,828	4,346,876	1,017,210	2,429,657	13,921,571
Nevada	4,067,717	2,718,588	132,088	1,784,039	8,702,432
New Hampshire	1,551,375	1,034,250	513,628	1,077,343	4,176,596
New Jersey	4,081,077	1,369,283	7,592,209	3,759,671	16,802,240
New Mexico	5,142,251	3,532,692	569,192	2,085,683	11,329,818
New York	14,890,167	5,969,236	23,182,089	2,193,741	56,235,233
North Carolina	7,889,021	6,730,557	2,228,665	4,403,745	21,251,988
North Dakota	4,636,956	3,354,211	293,266	1,943,458	10,237,891
Ohio	11,004,625	6,692,104	10,036,440	7,378,381	35,111,550
Oklahoma	6,792,684	4,862,915	1,894,839	3,107,078	16,657,516
Oregon	5,410,740	3,781,446	1,390,696	2,336,162	12,919,044
Pennsylvania	12,401,494	7,378,453	13,129,903	9,151,129	42,060,979
Rhode Island	1,551,375	1,034,250	1,239,835	1,077,343	4,902,803
South Carolina	4,296,021	3,551,622	1,193,051	2,346,686	11,387,380
South Dakota	5,015,308	3,578,441	336,863	2,049,249	10,979,861
Tennessee	6,859,664	5,346,451	2,507,980	3,698,867	18,412,962
Texas	20,579,679	13,779,662	8,308,754	9,926,764	52,594,859
Utah	3,621,837	2,395,894	734,900,	1,660,770	8,413,401
Vermont	1,551,375	1,034,250	270,049	1,077,343	3,933,017
Virginia	5,990,689	4,658,508	2,704,545	3,471,022	16,824,764
Washington	5,231,351	3,494,756	2,616,940	2,750,383	14,093,430
West Virginia	3,462,917	3,012,527	1,128,749	2,053,696	9,657,889
Wisconsin	7,469,414	5,211,771	3,396,239	3,946,702	20,024,126
Wyoming	3,925,992	2,660,899	188,578	1,744,646	8,520,115
Hawaii	1,551,375	1,034,250	583,212		3,168,837
Dist. of Col.	1,551,375	1,034,250	1,498,333	1,077,343	5,161,301
Puerto Rico	1,642,677	1,716,909	1,490,804		4,850,390

The Bureau of Public Roads spelled out last week how the $875 million in federal aid scheduled for state highways in the next fiscal year will be divided among the states (table).

The 1957 fiscal year starts July 1, 1956. By making the allocation now, BPR is five months ahead of the time limit. The reason why allocations are made early is to give the states more opportunity to plan their spending.

• **Divided among systems**—As in the current year, the $875 million will be divided like this among federal-aid highway systems:

• The 40,000-mi interstate system will get $175 million.

• Primary rural highways—about 182,000 mi—will get $315 million.

• Primary urban roads—about 14,000 mi—will get $175 million.

• The secondary system will get $210 million. This is made up of 483,000 mi of farm-to-market roads.

• **Matching ratios**—On the primary and secondary systems, states must match federal grants on a 50-50 basis. In states where the federal government owns land, federal aid increases above 50% by half the percentage of the state's total area that is federal land.

On the interstate system, matching is on the basis of 60% federal to 40% state. In states where the U. S. owns land, the federal-aid ratio increases by 0.4% of the percentage of the state's area that is federal land.

About 35% of the federal highway money goes to seven big states. Top state is New York with $56 million.

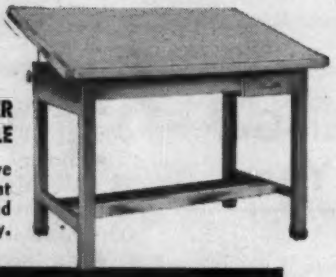
Lausche Strives to Save Ohio's Axle-Mile Truck Tax

Ohio Governor Frank J. Lausche is working to save the state axle-mile tax on trucks, which was dealt a serious blow by a recent ruling of the State Supreme Court. The court ruled that the tax couldn't be collected from truckers from Michigan, with whom Ohio has a reciprocity agreement. Ohio has to refund about $1 million to Michigan truckers, and loses its claim to another $2 million. The state also has agreements with about 20 other states.

But at last week's Governors' Conference in Chicago, Lausche succeeded in getting Wisconsin, Minnesota, and Tennessee to modify their agreements, while Virginia cancelled its agreement. Lausche is asking all the others to follow suit. There are 19 other states to be heard from, including Michigan, Illinois, Indiana, and Kentucky.

• **Please cooperate**—Lausche is telling other governors that Ohio is "boldly and honestly" trying to provide better highways. If many states fail to cooperate, he says the tax will have to be dropped. He promises that there will be no attempt to collect public taxes or drivers' license fees from out-of-state truckers.

The truck tax, now yielding about $12 million a year, was supposed to help pay off the $500-million highway bond issue authorized by voters in 1953. About 40% of the revenue has been coming from out-of-state truckers.



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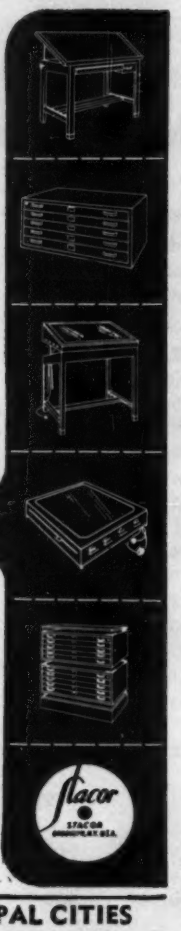

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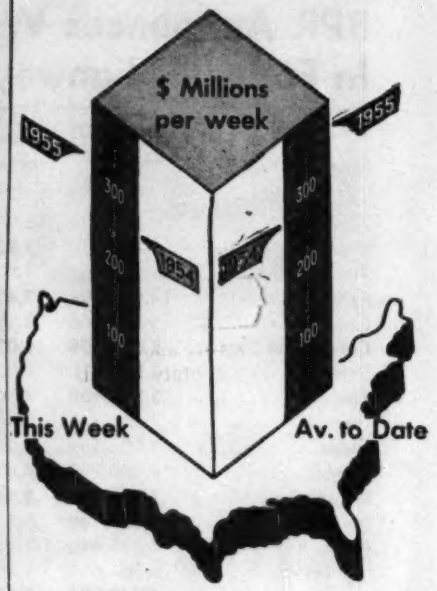
Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

(millions of dollars)

	This Week	Cumulative 33 wks 1955	1954	% chge
By Ownership				
Federal	$17.7	$1,155.6	$798.1	+45
State and municipal	116.4	3,427.5	3,095.5	+11
Total public	134.1	4,583.1	3,893.6	+18
Total private	188.1	7,499.5	5,231.8	+43
U. S. Total	$322.2	$12,082.6	$9,125.4	+32
By Type of Work				
Waterworks	$15.2	$174.4	$142.8	+22
Sewerage	6.1	244.1	239.4	+2
Bridges	9.4	306.5	312.6	−2
Highways	46.0	1,386.5	1,164.5	+19
Earthwork, waterways	3.4	335.9	174.5	+92
Buildings:				
Public, excl. hsg.	34.8	1,138.7	1,133.7	+0.4
Public housg.	14.7	183.4	158.8	+15
Private housg.	83.6	4,087.3	2,720.4	+50
Commercial	19.5	1,098.4	816.7	+34
Industrial	67.3	1,794.8	1,252.7	+43
Unclassified	22.2	1,332.6	1,009.3	+32
U. S. Total	$322.2	$12,082.6	$9,125.4	+32

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

New capital for construction

(millions of dollars)

	Week of Aug. 11	Cumulative 32 Wks 1955	1954	% Chge '54-'55
Corporate securities	$54.2	$2,140.1		+11
State and municipal:				
All except housing	32.6	2,669.1		−23
Housing	7.7	70.9		+1
Federal loans	1.9	83.1		+7
Federal aid	...	742.5		+18
Total nonfederal	96.3	5,705.7		−8
Federal appropriations:				
In U. S.	...	$516.1		−54
Outside U. S.	...	46.9		+65
Total new capital	$96.3	$6,268.7		−14

ENR cost and volume indexes, 1955

		Base years = 100 1913	1926	1949
Construction cost	8/11	672.55	323.29	140.99
	7/28†	672.24	323.15	140.92
Building cost	8/11	478.48	258.65	136.01
	7/28†	478.03	258.41	135.89
Volume	July	699	284	202
	June	633	257	183

† Official monthly indexes for Aug.

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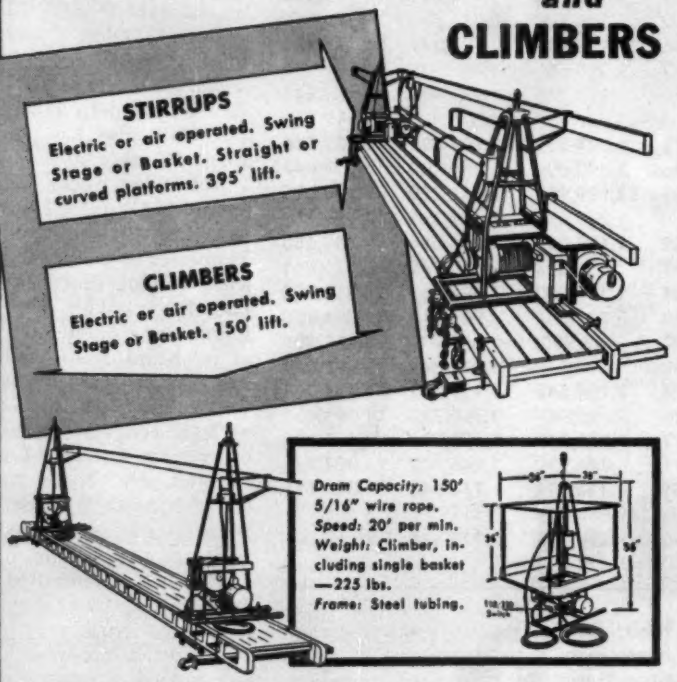

Drum Capacity: 150' 5/16" wire rope.
Speed: 20' per min.
Weight: Climber, including single basket —225 lbs.
Frame: Steel tubing.

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Labor Pools; Jobless Benefits

Denial of unemployment benefits to pool members during strike raises question of meeting federal requirements

The question of whether a state unemployment compensation law can deny jobless benefits during a strike to members of labor pools—such as exist in the construction and maritime industries—is about to be tossed to the U. S. Secretary of Labor.

A three-day hearing has been held in San Francisco to determine whether California's unemployment compensation system conflicts with federal law, and findings will be turned over to Labor Secretary Mitchell for decision.

The hearings were called by the federal Labor Department after the state Court of Appeals decided a group of beached maritime workers were not entitled to jobless pay during the 1948 San Francisco waterfront strike. Few workers are directly involved, but the issues are deep.

• **Issues**—More significant than the basic state's rights issue—whether the Labor Department can overrule state courts—is the issue of financing strikes from state funds and the cost to employers of an adverse ruling from the Secretary of Labor.

In order for employers to get the federal unemployment tax credit, the Secretary of Labor must certify that the state law under which payments are made conforms to the federal law. Otherwise, until the law was amended to conform with the federal interpretation, the federal government might be able to collect the full tax without any resulting benefits to employes through the State Fund.

Core of the problem is this: Whether workers employed under a collective hiring system but temporarily out of work should be refused jobless benefits at the time of the strike. It applies particularly to such industries as maritime and construction, where employes are usually chosen from labor pools supplied by labor unions, and where workers rotate on jobs. Each assignment may be for a new employer although the work will be similar.

Under the law, strikers may not collect unemployment compensation, but jobless pay cannot be denied to workers who refuse to cross picket lines. This is the part of the law the state and federal governments interpret differently.

• **Genesis**—In the 1948 strikes, ship stewards and firemen, ashore awaiting assignment when the strike began, filed claims for unemployment pay, contending they were unemployed when the strike started.

The State Department of Employment was ready to pay when the shipowners protested. They cited the language of the state law—"an individual is not eligible for benefits . . . if he left his work because of a trade dispute." The key words are "his work."

A state referee agreed that each claimant, although unemployed at the time of the strike, was part of the rotational maritime labor pool, and therefore had left "his work" as much as had the men who were at sea when the strike started. He reversed the awards, and the State Appeals Board sustained him in denial of benefits.

The Department of Labor intervened with its "new work" doctrine, saying a jobless man doesn't have to accept "new work" offered to him if it is strike-breaking work.

Last February, the California Supreme Court, final avenue of appeal, denied the petition of the unions for review. That put the issue back where it started, and the Labor Department revived the conformity question and set this month's hearing.

No matter how the tug-of-war goes, no one seriously expects California's unemployment insurance system to die. If the Department of Labor refuses to reverse its stand after the hearing, the state could probably seek injunctive relief through the federal courts. Employers too, are considering whether they might seek redress in federal courts. They don't want to see the law amended in such a way that it would amount to an invitation to the unions to let the State Fund finance a strike.

New Jersey Contractors Fight Higher Wage Costs

Contractors in New Jersey's Essex County got down to some brass tacks last week in a determined effort to hold the line on wages. They picketed one project and threatened to expel a member from their association.

The action of the Associated Contractors of Essex County came on the heels of a county-wide carpenters strike called on Monday to push demands for a two-year package wage increase in excess of 45 cents an hour.

Site of the picketing was Newark's old Center Market, now being renovated by a New York company, which has signed up independently with the carpenters. Typical of the picket signs carried by association members was one reading, "New York Owner Inflates Essex County Construction Costs."

Another breach occurred when association member Daniel J. Cronin, Inc. of Newark also went along with the carpenters. The result: A special meeting of the association this week to consider expelling Cronin from the association.

According to John Lowe, association president, county building costs are already higher than in most areas of the country and contractors are losing construction work. In an effort to stabilize costs, an April contract with bricklayers and laborers set the pattern of a 10-cent increase for a two-year period. That's what the contractors now offer the carpenters—except the termination date would be rolled back to April 30, 1957 to achieve uniformity among the trades.

Carpenters now get $3.50 an hour for a 7-hour day plus 3% for the welfare fund. They're asking 15 cents now and the same amount next August, 3% for a pension fund on Jan. 1 and another 1% for the welfare fund next August.

Labor Briefs . . .

• **GAW spreads**—While negotiations continued with Allis-Chalmers and International Harvester, the UAW-CIO extended its Ford and General Motors GAW plan to Caterpillar Tractor Company and John Deere. The economic packages which the union won amount to 23 and 26 cents an hour.

• **Big boost**—Local 79 of the AFL painters union in Denver, Colo., won a 25-cent wage boost in a new one-year contract that ended a two-week strike. And AFL sheet metal workers in a three-county area of Ohio settled for a two-year contract granting a 32.5-cent increase.

• **Plants close**—For the first time in 12 years, fifteen iron and steel fabricating plants in Buffalo, N. Y., shut down when Ironworkers Local 576 struck for a 15-cent wage boost under the reopening clause of their contract.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: August 25, 1955

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 25th day of August 1955, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

ONEIDA COUNTY

Lacy Ketchum, District Engineer, 109 No. Genesee St., Utica 1, N. Y.

Contract No.	Type	Name of Highway and Miles	Deposit for Plans	Bid Deposit	Dept. Estimate
M.T. 55-9	Grading, Drainage & Misc. Work	NYS Thruway-Mohawk Sect.-Sub. 7 & 8 (Westmoreland-Whitesboro-Utica West City Line) 1.37 Miles	$10	$3,000	$85,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract, is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: November 8, 1955

Government of Iraq

DEVELOPMENT BOARD
AND
MINISTRY OF DEVELOPMENT
BAQUBA RAILWAY BRIDGE
CONTRACT B/9 (1955)

The Development Board and Ministry of Development invite tenders from experienced Civil Engineering Contractors for the construction of a three-span railway bridge with steel superstructure approximately 174 metres long and 10 metres wide over the River Diyala at Baquba, together with the construction of the approach embankments thereto.

The Contract Documents and Conditions as to tendering may be inspected on and after the 8th day of August 1955 at any of the following places:—

(a) The offices of the Directorate General of 2nd. Technical Section, Ministry of Development, Baghdad, Iraq.
(b) The Embassies and Legations of Iraq in Washington, Paris, Rome, Brussels, Bonn, Cairo, Karachi and New Delhi.
(c) The offices of Rendel, Palmer and Tritton, 125 Victoria Street, London, S.W.I., England.

Firms desiring to tender may obtain the two copies of the Contract Documents between the 8th day of August 1955 and the 8th day of October 1955 (both days inclusive) from Directorate General of Legal Affairs and Contracts, Ministry of Development in Baghdad, or the offices of Rendel, Palmer & Tritton in London upon payment of twenty five Iraqi Dinars or the equivalent thereof for each 2 sets of documents.

Tenders must be accompanied by a deposit of ID.10,000/—(Ten Thousand Iraqi Dinars) either in cash or by a letter of guarantee to be made by or through an approved Bank established in Iraq. Full detailed conditions as to this deposit may be ascertained from the "Conditions of Tender" attached to the Contract Documents.

Tenders must be submitted to the Development Board (Directorate General of Legal Affairs & Contracts, Ministry of Development), Baghdad, Iraq, in sealed envelopes endorsed clearly on the outside with the words "Tender for Baquba Railway Bridge" and will be received up to noon on the 8th day of November 1955.

A Memorandum of Capacity, Method of Procedure and Articles of Association must be submitted at the same time.

Particular attention is drawn to Clause 8 of the "Conditions of Tender" stating that tenders will be accepted only from firms or Contractors who have previously executed works of a similar character and magnitude.

Tenders not submitted within the time specified or not accompanied by a receipt of the deposit, or a letter of guarantee and the Certificate of Membership of a Chamber of Commerce (if the Tenderer resides in a Liwa in Iraq where a Chamber of Commerce exists) shall be neglected.

The Board does not bind itself to accept the lowest or any tender.

Minister of Development.

Bids: September 13, 1955

Power Authority of the State of New York
St. Lawrence Power Project

ADVERTISEMENT FOR PROPOSALS
FOR
THE CONSTRUCTION OF
LONG SAULT CANAL CONSTRUCTION POWER
SPECIFICATIONS NO. PA-5-14041
ST. LAWRENCE CONTRACT NO. 21

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of Long Sault Canal construction power near Massena, St. Lawrence County, New York, in the following ways:

(1) If brought in person on the day of receiving bids, until 10:30 A. M. Eastern Daylight Saving Time on the 13th day of September 1955, 270 Broadway, Hearing Room C, on the 6th Floor, New York, New York.

(2) If mailed in, until 10:15 A. M. Eastern Daylight Saving Time on the 13th day of September 1955, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above.

The work includes the construction of approximately one mile of single circuit and 4½ miles of double circuit, 13.8 kv, wood pole transmission line. Completion of the work will be required on or before December 15, 1955.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York 7, New York upon application and prepayment of a fee of Ten ($10.00) dollars per initial set of contract documents and Five ($5.00) dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid. Each proposal must be accompanied by a draft or certified check payable to the order of the Power Authority of the State of New York for sum of $7500.00. Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents.

The right is reserved to reject any or all bids.

W. S. Chapin
GENERAL MANAGER

8/12/55

COMMONWEALTH OF MASSACHUSETTS. Department of Public Works. NOTICE TO CONTRACTORS: Sealed proposals for State Highway and Bridge Construction (Southeast Expressway) in the City of BOSTON (Contract A, Freeport Street to Neponset Circle), will be received at Room 427, 100 Nashua Street, Boston, Mass., until 2:00 P.M. (DST) of Wednesday, September 7, 1955, and at that place and time publicly opened and read. Proposal guaranty: $100,000. Charge for plans and proposal forms: $40.00, amount returnable only to bidders. Complete information at said office; plans on display at District offices. Minimum wage and dump-truck rates have been established. Right reserved to waive any informality in or reject any or all proposals. An award will not be made to a Contractor who is not equipped to undertake and complete the work.

By: JOHN A. VOLPE,
Commissioner of Public Works.
August 6, 1955.

Bids: September 1, 1955

CONTRACT O & M - 329

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
HOLLAND TUNNEL
CHEMICAL CLEANING OF STANDPIPE SYSTEM

Sealed proposals for furnishing all labor, material and equipment for cleaning approximately 17,000 feet of 6 inch water pipe in the Holland Tunnel will be received at the office of the Department of Purchase and Administrative Services, of The Port of New York Authority, Room 900, 111 Eighth Ave., New York 11, until 11:00 A.M. on Thursday, September 1, 1955, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase and Administrative Services.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, August 18, 1955

OFFICIAL PROPOSALS

Bids: September 13, 1955

New Jersey Turnpike Authority

CONTRACTS NOS. N-31A, N-31B, N-31-C, N-31D and N-31E

Sealed proposals are invited for Contracts Nos. N-31A, N-31B, N-31C, N-31D and N-31E in connection with the utility building, toll islands and associated work for the Newark Airport Interchange on the Newark Bay-Hudson County Extension of the New Jersey Turnpike, as follows:

Contract No. N-31A—General Construction
Contract No. N-31B—Structural Steel and Miscellaneous Iron Work
Contract No. N-31C—Plumbing
Contract No. N-31D—Heating and Ventilation
Contract No. N-31E—Electrical

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 O'clock, Eastern Daylight Saving Time, on the morning of September 13, 1955, at which time and place said proposal will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after August 16, 1955, at the office of the Authority, and at the office of the Consulting Architects, Lorimer and Rose, 254 West 54th Street, New York 19, New York. Contract documents will be furnished upon payment of Ten Dollars ($10.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman

August 12, 1955

Bids: September 1, 1955

Pennsylvania Turnpike Commission Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 a.m., Eastern Daylight Saving Time, the 1st day of September 1955, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contract:

For the construction of structures and the grading, drainage, and paving of the Turnpike Section 37L, part of the Northeastern Extension of the Pennsylvania Turnpike in the City of Scranton and South Abington Township, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point approximately 813 lineal feet southwest of the center line intersection with existing Legislative Route 35013 at Turnpike Station 379+00 in the City of Scranton, Lackawanna County; thence in a northeasterly direction 23,917 lineal feet more or less through an equality to Turnpike Station 618+13 at a point approximately 383 lineal feet southwest of the center line intersection with U. S. Routes 6 and 11 in South Abington Township, Lackawanna County, a distance of approximately 4.53 miles.

The approximate quantities of the principal items are as follows:

Class 1 Excavation	1,798,071 cu. yds.
Class 1A Excavation	15,680 cu. yds.
Class 2 Excavation	24,388 cu. yds.
Class 2A Excavation	2,280 cu. yds.
Special Subgrade	188,202 sq. yds.
Reinforced Concrete Pavement	122,923 sq. yds.
Class A Concrete	2,401 cu. yds.
Class B Concrete	5,792 cu. yds.
Plain Steel Bars	819,020 lbs.
Fabricated Structural Carbon Steel	723,000 lbs.
Fabricated Structural Manganese Steel	1,197,830 lbs.
Median Divider	21,729 lin. ft.
Cast-in-place Concrete Piling	3,953 lin. ft.

Copies of plans, specifications and other contract documents, including cross-sections, are on file and open to public inspection at the office of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on 12 August 1955. Plans, specifications, cross-sections and other contract documents will be available by this date for inspection or for mailing to prospective bidders. Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five (5) dollars per copy. Copies of cross-sections may be purchased from the Pennsylvania Turnpike Commission for the sum of fifty (50) dollars per set.

Plans and contract documents, for this section exclusive of cross-sections and the specifications, may be purchased from the Pennsylvania Turnpike Commission for the sum of twenty (20) dollars for each set. No refund will be made for plans returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P. O. money order to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications, contract documents, and cross-sections.

The character and amount of bid security to be furnished by the bidder is stated in the Instructions to Bidders.

The Commission reserves the right to waive any informalities in or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
3 August 1955

Bids: October 11, 1955

Wesley E. Seale Dam Project Near Corpus Christi, Texas

NOTICE TO BIDDERS

Sealed bids, in duplicate, will be received by the Lower Nueces River Water Supply District, at 211 Weber Building, Corpus Christi, Texas, until 1:30 P.M., C.S.T., Tuesday, October 11, 1955, and all bids will be publicly opened and read at 2:00 P.M., on that date, at the Corpus Christi Chamber of Commerce Office, 1201 N. Shoreline Drive, Corpus Christi, Texas, for constructing the

WESLEY E. SEALE DAM PROJECT ON THE NUECES RIVER, FIVE MILES SOUTH OF MATHIS, TEXAS.

The project consists of two Ambursen type reinforced concrete slab-and-buttress spillways 60 feet high, approximately 1346 feet and 1560 feet long, respectively; three sections of rolled fill dam approximately 2200 feet, 500 feet, and 400 feet long, respectively; an outlet structure and appurtenant works; and a field office building. The following approximate quantities are required for the principal items:

Stripping	75,000 cu. yds.
Core Trench Excavation	46,000 cu. yds.
General Excavation	146,000 cu. yds.
Trenching, and Finishing Excavation	30,000 cu. yds.
Backfill	14,000 cu. yds.
Embankments, Rolled Fill	787,000 cu. yds.
Embankments, Unclassified	110,000 cu. yds.
Topsoil	4,000 cu. yds.
Reinforced Concrete in Foundation Floors, Mats, and Paving	40,000 cu. yds.
Reinforced Concrete in Buttresses, Piers, Deck Slabs, Abutments and Structures	47,000 cu. yds.
Gravel Fill	31,000 cu. yds.
Riprap	26,000 cu. yds.
Rockfill	2,000 cu. yds.
Road Surfacing	12,000 sq. yds.
Steel Sheet Piling	5,650 tons
Reinforcing Steel	5,910 tons
Automatic Steel Crest Gates 9' x 37'	60 gates
Intake Tower, Complete with Valve & Sluice Gates	1 complete
Field Office Building 26' x 50' x 8'	1 complete

The plans, specifications, and bidding documents may be secured from the office of the general Manager, Lower Nueces River Water Supply District, 211 Weber Building, Corpus Christi, Texas; or from Reagan & McCaughan, 320 Wilson Building, Corpus Christi, Texas; or from Ambursen Engineering Corporation, 295 Madison Avenue, New York 17, or 603 Rosalie Avenue, Houston 6, Texas. A deposit of $100.00 is required for each set of plans and specifications. Upon return of plans and specifications in good condition within fifteen days after date of bidding to the Lower Nueces River Water Supply District, 211 Weber Building, Corpus Christi, Texas, the full deposit will be refunded to bona fide bidders and 50% to non bidders.

Bids must be made on the standard proposal form, in duplicate, and must be accompanied by a bid security in a total amount not less than 5% of the total maximum bid price. Of this bid security, it is mandatory under the Texas laws governing the District that a sum equalling not less than 1% of the total amount of the bid must be in the form of a certified check payable to the order of the Lower Nueces River Water Supply District. The remainder of the security may be in the form of a certified check or, at the option of the bidder, a bidder's bond. The District reserves the right to reject any and all bids, or to accept any bid deemed advantageous to it.

No bidder may withdraw his bid within 45 days after the opening thereof.

The successful bidder will be required to be bonded to the District in a sum equal to 100% of the amount of his proposal.

The bidder is hereby notified that the specifications contain the general prevailing wage scale and the Contractor shall not pay less than the wage rates so shown.

Dated this 2nd day of August 1955.

LOWER NUECES RIVER WATER SUPPLY DISTRICT
GUY I. WARREN
President
CHARLES GALLAND
Secretary

Bids: August 30, 1955

New Jersey Turnpike Authority

CONTRACT NO. N-56

Proposals are invited for Contract No. N-56 which involves miscellaneous construction including grading, drainage, paving, removal of existing construction, modification and/or reconstruction of existing structures, new structures, and other incidental work, between Communipaw Avenue and Grand Street and between Third Street and Jersey Avenue, in Jersey City, Hudson County, all in connection with the construction of the Newark Bay-Hudson County Extension of the New Jersey Turnpike.

The principal items of work include:

Roadway Excavation	3,100 Cu. Yds.
Borrow Excavation	3,200 Cu. Yds.
Subsurface Structure Excavation	5,400 Cu. Yds.
Storm Drain, Reinforced Concrete Pipe	7,800 Lin. Ft.
Storm Drain, Cast Iron Pipe	1,200 Lin. Ft.
Cast Iron Pipe Fittings	30,000 Lbs.
Manholes, Inlets and Catch Basins	142 Units
Bituminous Concrete Pavement	7,700 Sq. Yds.
Reconstruction of Pylon and Sign Bridge	Lump Sum

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock, Eastern Daylight Saving Time on the morning of August 30, 1955, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after August 15, 1955, at the office of the Authority and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York. Contract documents will be furnished upon payment of Ten Dollars ($10.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman

August 11, 1955

OFFICIAL PROPOSALS

Bids: September 1, 1955

CONTRACT O & M - 325

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY GRAIN TERMINAL
COLUMBIA STREET PIER
REPAIRS TO UNDERSIDE OF CONCRETE DECK

Sealed proposals for furnishing all labor, material and equipment for repairing the underside of the concrete deck of the Columbia Street Pier at the Port Authority Grain Terminal, Brooklyn, New York, will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Ave., New York 11, until 11:00 A.M. on Thursday, September 1, 1955, at which time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Dept., Room 1001, where a receipt in duplicate will be issued. The duplicate copy of the receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, August 18, 1955

Bids: August 30, 1955

CONTRACT O & M - 326

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT
PAVING REPAIRS AND DRAINAGE IMPROVEMENTS

Sealed proposals for furnishing all labor, material and equipment for paving repairs and drainage improvements at Newark Airport will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Ave., New York 11, until 11:00 A.M. on Tuesday, August 30, 1955, at which time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Dept., Room 1001, where a receipt in duplicate will be issued. The duplicate copy of the receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, August 18, 1955

Bids: August 30, 1955

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

RARITAN ROAD

Construction of Raritan Road from west of Central Avenue to west of Ruddy Street, Township of Clark, Union County, Federal Project No. S-197(1). Length 0.757 miles. The principal items of work are:

Estimated:	915	cu. yds. Roadway Excavation, Unclassified
	4,437	sq. yds. 5" Macadam Base Course
	4,437	sq. yds. 3" Mod. Pen. Macadam
	10,509	gals. Bituminous Material
	2,255	tons Bituminous Concrete
	1,937	lin. ft. Drainage

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, August 30, 1955, at NINE o'clock (9:00 A.M.-EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.-DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P. L. 413, 82nd Congress, and is to be performed in accordance with the "Required Provisions-Federal Aid Contracts" of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications. The attention of the bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans and supplementary specifications will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by the following documents: (1) a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00; (2) a proposal bond for a sum of not less than fifty percent (50%) of the total price bid for the project; (3) a financial statement (Part 1 of the Prequalification Questionnaire); (4) a plan and equipment statement (Part 2 of the Prequalification Questionnaire); and (5) a Non-collusion Affidavit executed in duplicate; and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: August 23, 1955

The Hydro-electric Power Commission of Ontario

ST. LAWRENCE POWER PROJECT
POWERHOUSE STRUCTURAL STEEL

SEALED TENDERS, in quadruplicate, addressed to the undersigned, 620 University Avenue, Toronto 2, Ontario and clearly marked

"TENDER FOR ST. LAWRENCE POWER PROJECT POWERHOUSE STRUCTURAL STEEL"

will be received up to 4:30 p.m. Eastern Daylight Saving Time on

TUESDAY AUGUST 23, 1955

for the supply, fabrication and delivery of the structural steel required for the Ontario Hydro powerhouse.

Delivery of anchor bolts is required by May 1, 1956, all other material for the Erection Bay and Administration Building not later than September 1, 1956, and all other material for the Switchgear Structure not later than April 1, 1957.

Copies of the tendering documents may be obtained on or after August 5, 1955, at the office of the Director of Supply, 620 University Avenue, Toronto 2, Ontario, on payment of $25.00 for each set. This charge will not be refunded.

Tendering documents may be inspected at the above location and at the offices of the following: The Commission's Field Office, Cornwall, Ontario; Power Authority of the State of New York, 270 Broadway, New York 7, New York; and Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts.

The lowest or any tender will not necessarily be accepted.

E. B. EASSON
SECRETARY

Bids: October 3, 1955

Construction of a Sewerage Treatment Plant

ADVERTISEMENT

Notice is hereby given that sealed bids will be received for Section G in accordance with the law by the Puerto Rico Aqueduct and Sewer Authority until 3:00 o'clock P.M. on the third day of October, 1955, at the office of the Authority in Santurce, Puerto Rico, and will then be publicly opened and read.

The work comprises furnishing materials and performing the labor for the construction of the Puerto Nuevo Sewage Treatment Plant, a primary sewage treatment plant with an initial capacity of twenty-four (24) million gallons per day including influent sewer, influent junction chamber, screening chamber, main sewage pumping station, grit chamber, settling tanks, effluent chamber, outfall sewer, sludge pumping station, sludge digestion tanks and digester control building, non-potable water supply system, administration building, garage and shop, outside connecting piping, roadways and paths, grading, miscellaneous structures and appurtenances and the installation of screening, grit handling, settling tank, chlorinating and pumping equipment furnished by others.

Copies of the plans and specifications may be examined without charge at the office of the Puerto Rico Aqueduct and Sewer Authority, Santurce, Puerto Rico, or at the office of Buck, Seifert and Jost, Consulting Engineers, 223 Manuel V. Domenech Street, Hato Rey, Puerto Rico and 112 East 19th Street, New York 3, New York. Copies thereof may be obtained at the office of the Treasurer of the Puerto Rico Aqueduct and Sewer Authority, Stop 26-½, Fernandez Juncos Avenue, Santurce, Puerto Rico or at the office of Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York, upon deposit of cash or certified check payable to the Puerto Rico Aqueduct and Sewer Authority in the amount of One Hundred and Fifty ($150.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within twenty (20) days after the date on which bids are received or else the entire deposit will be forfeited.

Bids will be received only from persons who have requested the plans and specifications and made the required deposit therefore under their own names. These documents cannot be obtained later than September 16, 1955.

Each proposal must be accompanied by a certified check or bid bond from a reliable surety company authorized to do business in Puerto Rico and satisfactory to the Authority in amount equal to five (5%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority or the liability bond will accrue in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The Authority reserves the right to consider bids for thirty (30) days after their receipt before awarding any contract and the right is reserved to waive any informalities, to accept any bid or to reject any or all of them.

PUERTO RICO AQUEDUCT AND SEWER AUTHORITY
by RAFAEL V. URRUTIA
Executive Director

BUCK, SEIFERT AND JOST
Consulting Engineers

Bids: August 25, 1955

New York State Road Works

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 25th day of August 1955, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

(Continued on opposite page)

New York State Road Works

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, N. F. Ronan, Acting District Engineer, 353 Broadway, Albany, N. Y.						
Albany	FARC 55-55	Altamont Village, S.H. 849 Dunnsville-Altamont, S.H. 1279 Proj. No. 8427(2)	0.96	9" Cem. Conc. Pavt. 24'-38' Wide.	$18,000 Plans $10	$324,000
Albany	T.C. 55-2	Albany-Watervliet, S.H. 977 Loudonville-Menands, S.H. 1879 Troy-Menands Bridge and Approach, S.H. 9112	0.60	Traffic Signal System	$1,300 Plans $10	23,000
Saratoga	FASH 55-1	Bemis Heights-Schuylerville Proj. No. F391(10)	9.61	9" Cement Concrete Pavt. 24' Wide=9.56 Mi. Misc. Work=0.05 Mi. Comp. I-Beam Bridge 332'	$122,000 Plans $25	$2,212,000
Schenectady	ST 55-4	New York State Thruway-Mohawk Section, Sub. 1-1 (Dahlia Road Extension)	0.40	Bit. Mac. Type 1 (Pen. Method)	$1,100 Plans $10	21,000
Schenectady	M 55-2	Lock 8, Erie Canal, Scotia		New Upper and Lower Gates; Reconstruct a Lower Sill; Plating of Portions of Walls	$9,000 Plans $10	161,044
Washington	FARC 55-57	Thomson-Ft. Edward, Pts. 1 & 2, S.H. 1685A Proj. No. F391(11)	8.93	Asp Conc. Opt.	$45,000 Plans $50	976,000
DISTRICT No. 2, Lacy Ketchum, District Engineer, 109 No. Genesee St., Utica, N. Y.						
Oneida	FGRC 55-64 FARC 55-65 FASH 55-8	Marcy Hill-Trenton, S.H. 931; Trenton-Remsen, S.H. 1144; Trenton-Prospect-Remsen, S.H. 5345; Trenton By-Pass. Proj. F-FG-752(5); S-281(3)	5.61	9" Cement Conc. Pavt. 2 @ 24' Wide=3.60 Miles Asp. Conc., Opt.=1.92 Miles 1 RR Sep. Plate Girder 78 3 Brs. Comp. I-Beams 124', 74' and 175' 1 Br. R. C. Arch 40' 1 Hy. Sep. Comp. I-Beam 147.5'	$180,000 Plans $50	3,268,000
DISTRICT No. 3, Wm. Robinson, District Engineer, Weigh Lock Building, Syracuse, N. Y.						
Cortland	FARC 55-58	Blodgett Mills-Cortland, S.H. 881 Proh. F-481(6)	0.18	Asp. Conc., Opt. R.C. Slab Br. Twin 35' Spans	$7,000 Plans $10	120,000
Oswego	FAC 55-15	City of Oswego. East River Road and East First Street Proj. U-583(6)	2.17	9" Cement Conc. Pavt. 24'-48' Wide	$27,000 Plans $10	$486,000
Seneca	O.T. 55-8	New York State Thruway-Ontario Section-Sub. 1 (Junius Pond Gas Station-Restaurant Site)	....	Planting Trees, Shrubs and Vines	$110 Plans $10	2,000
DISTRICT No. 4, B. F. Perry, Acting District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Monroe	FASS 55-1	East River Road (County Road) Proj. S-334(1)	0.56	Asp. Conc., Opt =0.53 Mi. Misc. Work=0.03 Mi. Comp. I-Beam Br. 146'	$12,000 Plans $10	223,000
Orleans	FARC 55-9	Yates-Lyndonville-Ridgeway, S.H. 581 Proj. S-407(1)	1.04	Asp. Conc. Ty. 2A=1.00 Mi. Misc. Work=0.04 Mile	$12,000 Plans $10	224,000
Wyoming	FARC 55-54	Alden-Cowlesville, Pt. 2, S.H. 9040 Bennington-Attica, Pt. 1, S.H. 9042 Proj. S-406(1)	0.70	Asp. Conc., Opt.=0.59 Mi. Misc. Work=0.11 Mile 2 Conc. Box Brs. 27' & 25'	$17,000 Plans $10	286,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, 65 Court Street, Buffalo, N.Y.						
Cattaraugus	FARC 55-60	Ellicottville-Machias, Pt. 1, S.H. 9212 Proj. F-603(6)	0.45	Asp. Conc. Opt.=0.25 Mile Misc. Work=0.20 Mile 2 Comp. I-Beam Brs. 66' & 66'	$13,000 Plans $10	232,000
Chautauqua	E.T. 55-4 S.T. 55-6	New York State Thruway-Erie Sect.-Subd. E-1B (Barden Rd. to Westfield) and 5 Marginal or Cross Roads	5.32 (Acc.) (1.94)	Two crse. Cement Conc. Pavt.=5.12 Mi. Cement Conc. Pavt. Br.=0.12 Mi. Bit. Mac. Ty. 1=1.44 Mi. B.S.T. Graded Grav.=0.48 Mi. Misc. Work=0.06 Mi. 4 Hy. Seps. Comp. I-Beams 338.2', 275.5', 364.5' & 412.3' 1 R.C. Rig. Fr. Br. 62.8' 1 Comp. I-Beam Br. 430'	$272,000 Plans $100	4,950,000
Chautauqua	E.T. 55-5 S.T. 55-7	New York State Thruway-Erie Sect.-Subd. E-2A (Westfield to West Forest Road); Westfield Interchange and 3 Secondary Cross Roads	4.73 (Acc.) (2.88)	Two Crse. Cem. Conc. Pavt.=6.32 Mi. Cem. Conc. Pavt. Br.=0.13 Mi. Asp. Conc. Ty. 2B=0.25 Mi. Bit. Mac. Ty. 1=0.63 Mi. Misc. Work=0.28 Mi. 5 Hy. Seps. Comp. I-Beams 249.8', 254.3', 257.4', 192' & 184.6'	$215,000 Plans $100	3,925,000
Erie	E.T. 55-3 S.T. 55-5	New York State Thruway-Erie Sect.-Subd. E-7B (Shadagee Road and Eighteen Mile Creek Bridge and Approach); Shadagee Road,	0.40	Two Crse. Cem. Conc. Pavt.=0.17 Mi. Cem. Conc. Pavt. Br.=0.12 Mi. Asp. Conc. Opt.=0.11 Mi. Deck Girder Br. 632' NB and 630' SB	$110,000 Plans $15	1,941,000
Erie	E.T. 55-6 S.T. 55-8 R.C. 55-71	New York StateThruway-Erie Sect. Subd. E-8A(Camp Road to Bayview Road); Camp Road Interchange; Athol Springs-Hamburg, S.H. 1067; Buffalo-Hamburg, S.H. 2, and 3 Secondary Cross Roads	2.33 (Acc.) (4.59)	Two Crse. Cem. Conc. Pavt.=5.52 Mi. Cem. Conc. Pavt. Br.=0.25 Mi. Asp. Conc. Opt.=0.99 Mi. Misc. Work=0.16 Mi. 5 Hy. Seps. Comp. I-Beams 260.5', 291.5', 254.8', 355.8' and 158.7'	$185,000 Plans $50	3,350,000
Niagara	FARC 55-68 FASH 55-9	McNalls-Alabama, Pt. 1, S.H. 9338 McNalls-Alabama, Pt. 1A, Proj. S-457(1)	3.88	Asp. Conc., Opt.=3.85 Mi. Misc. Work=0.03 Mi.	21,000 Plans $15	380,000
Niagara	FARC 55-61	North Tonawanda-Sanborn, Pts. 1 & 2 S.H. 643 Proj. S-390(1)	3.15	Asp. Conc., Opt.=3.13 Mi. Misc. Work 0.02 Mi. Widening Exist'g. R.C. Slab Br.	$26,000 Plans $15	482,000
Erie & Niagara	M 55-3	Bush's Bridge E-243 East Robinson Street Extension	0.40	Asp. Conc. Opt.=0.21 Mi. Misc. Work=0.19 Mi. Plate Girder Br. 351'	$26,000 Plans $25	472,400
DISTRICT No. 6, J. H. Thomas, District Engineer, 30 West Main St., Hornell, N. Y.						
Chemung	FASS 55-6	Chemung-Van Etten, C.R. 3 Proj. S-86(3)	1.71	Bit. Double Surface Treatment 2 Comp. I-Beam Brs. 60' & 60'	$19,000 Plans $15	345,000
Steuben & Yates	FARC 55-62	Wayne-Keuka-Penn Yan, Pt. 1, S.H. 1779 Keuka-Penn Yan, Pts. 2 & 3, S.H. 8435, 8523 Proj. F-529(6)	8.62	Asp. Conc., Opt. I-Beam Br. 34' (Widen)	$80,000 Plans $50	1,553,000
Tioga	FASS 55-2	Berkshire-East Berkshire, Co. Rd. 202 Proj. S-302(1)	0.14	F.C. Grav. Bit. D.S.T. Comp. I-Beam Br. 158'	$7,500 Plans $10	136,000
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Duzee St., Watertown, N. Y.						
St. Lawrence	FARC 55-70	Gouverneur-Edwards, Pts. 1 & 2 S.H. 1263-1389 Proj. S-441(1)	3.96	Asp. Conc., Opt.=3.74 Mi. Misc. Work=0.22 Mi.	$40,000 Plans $25	727,000
St. Lawrence	FASH 55-7 FARC 55-60	Massena South Side Route, Pt. 2 (Contract 1) Massena-Helena, Pt. 1, S.H. 1261 Proj. U-UG-580(9)	5.02	Asp. Conc., Opt.=5.00 Mi. Misc. Work=0.02 Mi. RR Sep. I-Beam 205.3'	$90,000 Plans $25	1,651,000
DISTRICT No. 8, J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Orange	C.T. 55-9	New York State Thruway-Catskill Section-Subd. 6 (Harriman Maint. Bldg. Site)	....	Grading, Paving & Misc. Work	$2,500 Plans $10	44,000
Orange	C.T. 55-10	New York State Thruway-Catskill Section-Subd. 5 (Newburgh Maint. Bldg. Site)	....	Grading, Paving & Misc. Work	$2,800 Plans $10	48,000
Putnam	FARC 55-66 FGRC 55-67	Brewster-Carmel, S.H. 909 Proj. F-FG-590(2)	2.09	9" Cem. Conc. Pavt. 24' Wide=2.05 Mi. Misc. Work=0.04 Mi. Comp. I-Beam Br. 130' RR. Sep. Comp. I-Beam 180'	$60,000 Plans $15	1,112,000
Rockland	FARC 55-56	Suffern-Mt. Ivy, S.H. 1448 Proj. F-637(3)	1.60	9" Cem. Conc. Pavt. 24' Wide=1.58 Mi. Misc. Work=0.02 Mi.	$35,000 Plans $10	644,000
Ulster	FASS 55-4	Rosendale-Tillson, C.R. 113 Proj. S-423(1)	0.08	Asp. Conc., Opt. Comp. Girder & R.C. Slab Br. 153.3'	$15,000 Plans $10	275,000
Westchester	H.T. 55-6	New York State Thruway-Hudson Section-Subd. 10 (Ardsley Gas Station-Restaurant Site) (Type CM)	....	Grading, Paving & Misc. Work	$9,000 Plans $10	156,000
DISTRICT No. 9, F. W. Donovan, District Engineer, 71 Frederick St., Binghamton, N. Y.						
Delaware, Otsego, & Schoharie	R.C. 55-59	Br. No. 1 & Br. No. 2, S.H. 982; Br. No. 1, S.H. 5384; Br. No. 2, S.H. 239; Br. No. 1, S.H. 987-A; Br. No. 1, S.H. 5195; Br. No. 2, S.H. 8270; Br. No. 1, S.H. 1215; Br. No. 1, S.H. 5458	....	Cleaning & Painting 9 Bridges	$1,500 Plans $10	26,000
Sullivan	R.C. 55-63	Narrowsburg-Callicoon, Pt. 3, S.H. 8449 Callicoon-Long Eddy, Pt. 2, S.H. 8494	0.32	Repair, Clean & Paint 2 Bridges	$2,500 Plans $10	46,000
DISTRICT No. 10, M. E. Goul, District Engineer, Montuck Highway at Little East Neck Road, Babylon, L. I., N. Y.						
Bronx	FACBE 55-1	Cross Bronx Expressway Cont. 1C (Anthony Ave.-Longfellow Ave.) Proj. IN-1084(21)	1.22	Demolition of Buildings	$40,000 Plans $10	760,000
Nassau	PSC 7378-8966	Elimination of Grade Crossings of the Long Island Railroad with Various Streets in the Hamlet of Baldwin and Village of Freeport	0.35 (1.56) (RR)	Railroad Relocation=1.56 Mi. Asp. Conc. Opt.=0.26 Mi. Cem. Conc. Pavt.=0.09 Mi. 4 Plate Girders 80', 85.5', 69' & 76.5' 1 Viaduct and Station 920'	182,000 Plans $100	3,337,000

(Continued on following page)

OFFICIAL PROPOSALS

New York State Road Works

(Continued from preceding page)

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions apply to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: September 7, 1955

Harbor Construction Work for United States Naval Facilities at East Rota, Spain (Re-Advertisement for Bids)

Brown-Raymond-Walsh, Prime Contractors for the construction of United States Military Bases in Spain, will solicit bids for the second time on harbor construction work to be performed for United States Naval Facilities at East Rota, Spain. All the bids for this job received on 27 July 1955, have been rejected by the Officer In Charge of Construction and this notice constitutes a re-advertisement of the ROT-6 project.

It is expected that the scope of the work will include:

Harbor dredging of approximately 2,300,000 cubic meters.

Construction of breakwater and marginal wharf, comprising approximately 2,600,000 tons of rock and concrete.

Construction of a tanker unloading pier and trestle approach.

The core of the main breakwater will consist of quarry rock; the principal armor will consist of 16 and 25 ton tetrapods and natural stone; the marginal wharf will be gravity type requiring 50 ton precast concrete blocks.

Bids will again be considered only from Spanish-American combined enterprises each of which are composed of at least one established Spanish construction company and at least one established American construction firm whose combined firms can meet the following conditions:

(a) They must furnish satisfactory evidence that they have completed similar projects recently. As a consideration of award, bidders will submit statements to the Prime Contractor showing the volume of similar work they have done in the past five years, by years, listing the amount of each contract, where constructed, the owner, size and time consumed in completing the projects.

(b) They must be able to supply from within their own organization experienced managerial and technical personnel.

(c) The successful combined enterprise will be required to complete the work within 30 months from the date they receive the notice to proceed.

(d) Certified financial statements will be required by the Prime Contractor as proof of the capability of the low bidder to finance mobilization of the job and all construction expense above current payments.

The successful combined enterprise may sublet the work for dredging and related activities to an American or European subcontractor, provided that such secondary sub-contractor is first approved by Brown-Raymond-Walsh.

The combined enterprise will be required to furnish all equipment, material and supplies required to complete the work in accordance with the specifications. Such equipment, material and supplies, including those of any secondary sub-contractor will be allowed to enter Spain duty-free provided it is guaranteed that all items not consumed in the completion of the work will be removed from Spain upon completion of the project.

Payment for the work will be made in both pesetas and U. S. Dollars. For comparison of bid purposes only, the rate of exchange will be fixed at forty-three pesetas to one U. S. Dollar.

Sealed bids, endorsed "Bid for Rota Waterfront -ROT-6A" will be received until 6:00 p.m. Wednesday, 7 September, 1955, at the offices of Brown, Raymond-Walsh, Edificio Espana, Madrid, and at that time publicly opened.

Bids will be accompanied by a provisional bid bond in the form of a Bank Draft or Certified Check for not less than one hundred fifty thousand dollars ($150,000.00) or six million four hundred fifty thousand pesetas (6,450,000.00 pesetas) to guarantee that the successful bidder will execute the contract on receipt of the Notice of Award. Upon execution of the contract documents all provisional bid bonds will be returned. Bids must further be accompanied by a performance bond either in the form of a letter from an approved American Surety Company guaranteeing performance in the amount of five million dollars ($5,000,000.-00) or as a guarantee from an acceptable Spanish bank in equivalent peseta amount.

Drawings, specifications and other bidding information may be obtained 15 August 1955, and thereafter upon application to the office of Brown-Raymond-Walsh in Madrid. Deposit of Certified Check, in the amount of two thousand pesetas (2000 pesetas) payable to the account of Brown-Raymond-Walsh will be required as security for the safe return of each set of the bidding data.

Bids: Sept 1, 1955

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Daylight Saving Time, on September 1, 1955 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATION AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE WANTAGH-OYSTER BAY EXPRESSWAY, NASSAU COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-78

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.

(b) Mr. M. E. Goul, District Engineer, 325 West Main Street, Babylon, Long Island, N. Y.

(c) Mr. Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a est of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's Estimate of cost for this work is $22,400.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Propsal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,120.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

J. W. JOHNSON
Superintendent of Public Works

Bids: August 23, 1955

The Hydro-Electric Power Commission of Ontario

ST. LAWRENCE POWER PROJECT
ELEVATED STEEL WATER TANK
VILLAGE OF IROQUOIS

SEALED TENDERS in quadruplicate, addressed to the undersigned, 620 University Avenue, Toronto 2, Ontario, and clearly marked

"Tender for St. Lawrence Power Project, Elevated Steel Water Tank for Village of Iroquois" will be received up to 4.30 o'clock p.m., Eastern Daylight Saving Time, on Tuesday, August 23, 1955 for the supply and erection of an elevated steel water tank of 208,000 imperial gallons capacity and 125 feet high for the new townsite of the Village of Iroquois, Ontario. The work is to be completed on or before April 1, 1956.

Copies of the tendering documents may be obtained on and after August 9, 1955, at the office of the Director of Supply, 620 University Avenue, Toronto 2, Ontario, on payment of $10.00 for each set. This charge will be refunded on the return within 14 days after the award of contract of each set of documents in good condition.

Tendering Documents may be inspected at the above location and at the offices of the following:

The Commission's Field Offices at Cornwall and Morrisburg, Ontario; Power Authority of the State of New York, 270 Broadway, New York 7, New York; and Uhl, Hall and Rich, 230 Congress Street, Boston 10, Massachusetts.

The successful tenderer will be required to furnish a performance bond in the form approved by the Commission, and issued by a bonding company licensed as such in the Province of Ontario and acceptable to the Commission, for one hundred percent (100%) of the total amount of its contract.

The lowest or any tender will not necessarily be accepted.

E. B. EASSON,
Secretary.

Bids: September 1, 1955

Delaware River Joint Toll Bridge Commission

Administration Building
Morrisville, Pennsylvania

NOTICE TO CONTRACTORS

Sealed proposals will be received by the Delaware River Joint Toll Bridge Commission until eleven o'clock A. M., Eastern Standard Time, September 1, 1955, for all labor, material, tools and equipment required for painting parts of the steel superstructure, in general the trusses of the main span, of the toll bridge across the Delaware River between Easton, Pennsylvania-Phillipsburg, New Jersey.

Proposals must be submitted on the form furnished by the Commission, and each proposal shall be accompanied by a certified check in the amount of Two Thousand Dollars ($2,000.00) made payable to the "Treasurer of the Delaware River Joint Toll Bridge Commission", as a guarantee of good faith.

Specifications are on file at the offices of the Commission, in the Administration Building, Morrisville, Pennsylvania, and in the Administration Building, Phillipsburg, New Jersey, and can be obtained upon application.

All proposals shall be submitted in separate sealed envelopes, each marked "Proposal for Painting the Easton, Pennsylvania-Phillipsburg, New Jersey Bridge", and forwarded only to the office of the Comptroller of the Commission, in the Administration Building, Morrisville, Pennsylvania.

The right is reserved to reject any or all bids; to waive any informality in the bids received; and to award the contract only to those experienced in the class of work and to the bidder (or bidders) whose proposal is deemed by the Commission to be most advantageous to the public interest.

DELAWARE RIVER JOINT
TOLL BRIDGE COMMISSION
By:
Doris S. Jones
Secretary of Commission

Date: July 29, 1955.

DESIGN ENGINEERS

PERMANENT OPPORTUNITIES
AT OUR

Cleveland, Ohio, offices with an engineering firm having over 50 years of successful operation doing business all over the world.

The McKEE organization continues to grow and expand and continues to offer many permanent present and future opportunities for qualified, experienced ENGINEERS and DESIGNERS in the following fields:

—STRUCTURAL STEEL
—CONCRETE
—ELECTRICAL
—HEAVY MACHINERY
—PIPING
—PROCESS HEATERS
—EQUIPMENT SPECS
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—MECHANICAL
and
—ELECTRICAL DRAFTSMEN
—PIPING DRAFTSMEN

Applicants should have at least 5 years of good design experience in any of the above fields, applicable to heavy construction as described below—

McKEE designs and constructs Blast Furnaces, Open Hearth Furnaces, Sintering Plants and Auxiliary Facilities; Oil Refineries, Chemical and Petro-Chemical Plants and Atomic Energy, Aluminum, Industrial and Other Non-Ferrous Metal Plants; All of these afford a wide diversification of opportunities to energetic and qualified engineers.

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Please Send Resume To:

Edward A. Kolner

ARTHUR G. McKEE & CO.
2300 Chester Avenue
CLEVELAND, 1, OHIO

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Construction Foreman for firm engaged in extensive sewer, water main and treatment plant facilities. Permanent position in N. Y. State area. Only qualified applicants with broad experience. P-6595, Engineering News-Record.

Wanted: Instructor in engineering drawing and descriptive geometry. Salary $3600 for 9 month period. Dept. of Engr. Drawing, University of North Dakota, Grand Forks, North Dakota.

Master Mechanic Wanted must be experienced in heavy construction equipment of all types. Good opportunity with established contractor, in Southwestern Pennsylvania. Send complete resume, with name, address and salary requirements. P-7313, Engineering News-Record.

Wanted—Experienced sand and gravel man. Must be able to set up plant and produce sand and screened and crushed gravel from river deposit. Work in Northwest. Give full particulars. P-7310, Engineering News-Record.

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant | **Civil Service Opportunities . . .** | **Employment Agencies**
Positions Wanted | **Selling Opportunities Wanted** | **Employment Services**
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The advertising rate is $24.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
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Send NEW ADS to ENGINEERING NEWS RECORD, 330 W. 42nd St., N. Y. 36, N. Y. for September 1st issue closing August 22nd

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DESIGNERS AND DRAFTSMEN

Electrical, Mechanical
Structural & Hydraulic

Reinforced Concrete
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With municipal experience on sewers and pavements to serve as chief of party. Permanent position under civil service with retirement plan.

APPLY PERSONNEL DIRECTOR
City Hall, Royal Oak, Michigan

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National Sanitary Equipment Manufacturer. Territory—Chicago & Midwestern States. Experience with Consulting Engineers or State Health Department preferred. Send photo and resume with salary expectancy to

P-7277, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS VACANT

Engineers—Experienced in design and preparation of plans for water works and sewerage systems and structural design. Advise education, experience, salary requirements and when available. Location Eastern New York. Reply P-7171, Engineering News-Record.

Architect—Qualified through training and experience to design churches, schools and other buildings. Give full information as to education, experience, salary requirements and when available. Location Eastern New York. P-7172, Engineering News-Record.

Wanted: Instructor and Half-time graduate assistants in engineering drawing and/or mechanics subjects. Opportunity to earn advanced degrees. Write: Head, Department of Civil Engineering, Lehigh University, Bethlehem, Pennsylvania.

Cost Analyst for engineering dept. planning group. Graduate Engineer—construction cost & engineering background. Analytical min, personality, initiative, are important. Location: Southwest Ohio. P-7229, Engineering News-Record.

(Continued on following page)

SALES ENGINEERS

Leading nationally known manufacturer expanding production and sales. Offers excellent opportunity for engineers desiring sales, promotion, and construction service work. Graduate preferred but experience may be substituted. Highway and concrete engineering background desirable for contacts with highway departments, contractors and concrete products companies.

Permanent positions with excellent opportunity for advancement. Attractive salary, company car and expenses with liberal company sponsored benefits. Positions available in several district offices.

P-7439 Engineering News Record
520 N. Michigan Ave., Chicago 11, Ill.

Procter & Gamble needs

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(Graduated within last 10 years)

- Permanent positions in Mechanical Research and Development, Process Equipment Design and Application, Heat and Power Equipment Design, Construction Management and other Engineering Fields.
- Salaries commensurate with education and industrial experience.
- Opportunities to grow with a leading chemical processing company—rated as one of the nation's three best-managed companies by the American Institute of Management.

For application form and further information write

Mr. T. M. Turner
Head of Employment
Engineering Division
Procter & Gamble
Cincinnati 17, Ohio

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Openings currently exist at

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Write giving full particulars concerning education, experience, personal history and availability, to:

Richard L. Shaw,
Personnel Director

MICHAEL BAKER, JR., INC.
Consulting Engineers

Baker Bldg. Rochester, Pa.

GRADUATE ENGINEER

(Mechanical Preferred)

Experienced in design and manufacture of Batch Type Bituminous Plants. New department being created—excellent opportunity for advancement with leading heavy equipment manufacturer. Salary commensurate with qualifications. Also Engineers experienced in crushing, screening, conveying and bituminous equipment. All replies kept confidential. Send full details of personal and experience record with first letter.

P-7381, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS VACANT

(Continued from preceding page)

Civil Engineer—qualified to design and to prepare specifications and cost estimate for earth dams and appurtenances. Location, Ohio. P-7230, Engineering News-Record.

Sales Manager for manufacturer of concrete form accessories. Must be experienced in construction practices, read prints. Qualified to organize and supervise sales for national coverage. Give full details including salary expected in first letter. Opportunity of lifetime for right man. P-7236, Engineering News-Record.

Draftsmen—Junior and Senior Architectural. Excellent future for qualified men. State age, education, experience, references and salary expected. Warren Holmes Company, 2200 Michigan National Tower, Lansing 8, Michigan.

Transitman experienced stadia, general surveying, capable drafting, calculation. Steady employment. Upper Westchester County. Reply references, education, age, salary required. J. L. Wilson, Box 81, South Salem, N. Y.

Construction Engineer for general contractor doing engineering type construction. We want a man that has growth possibilities and wants to get ahead. P-7295, Engineering News-Record.

Construction Superintendent for heavy construction job. Send resume with your requirements. P-7296, Engineering News-Record.

Bridge Engineer (Structural) Nationally-known construction firm specializing in foundation and concrete construction desires structural engineer with experience in bridge and cofferdam designing. Must be able to contact consultant and designing engineers in promotional work. Complete details and photograph should accompany letter of application. Address reply to P-7294, Engineering News-Record.

Construction Superintendent—General Contracting firm operating in West Virginia, Maryland and Pennsylvania, specializing in the construction of commercial and public buildings, desires man for project superintendent. Engineering background preferred. Must have references to demonstrate that he has administrative ability and can handle all phases of work required by the project. Reply giving age, resume of experience and salary required. P-7292, Engineering News-Record.

Civil Engineers—By established public utility supervisory—consulting organization—Junior—2-3 years experience, preferably in field on construction and/or surveying for work in connection design and operation hydro systems, also structural, foundations for steam and Diesel plants. Assistant—age 30-45 years, minimum 5 years experience structural steel, reinforced concrete and foundation design of steam electric power plants. Location New York. Some travel field future. Reply stating age, education, experience, personal particulars, minimum salary expected. P-7378, Engineering News-Record.

Mechanical & Electrical engineers for consulting office with high grade architectural clientele. Write full details to Daniel B. Stevenson, Jr., Empire Building, Des Moines, Iowa.

Come to California! Civil Service. Office Engineer needed by City of San Gabriel. College graduate with two years civil engineering. Municipal experience helpful. Also interviewing for engineering draftsman. Experience. High school education. Apply Personnel Department, City Hall, San Gabriel, California.

Superintendent of Public Works: The town of Natick, Massachusetts has a position of Superintendent of Public Works open. Those interested in making application for this position should write details of training, experience and salary required to the address below. A detailed prospectus of the position will be sent to such applicants. Address: T. Herbert Evans, 16 Park Ave., Natick, Mass.

Plumbing, heating, mechanical piping of all kinds we need the best project manager available for a permanent connection with a live wire company having a history of eighty years in the industry operating all over the country. Write to Box P-7345, Engineering News-Record, giving experience, personal history, present status and income.

Civil Engineer (Expressways)—$592.14 to $709.54 per month; graduation from college or university, specialization in civil engineering; registered as a professional engineer in Wisconsin or eligibility thereto. Ten years' experience in civil engineering work, five years in supervisory capacity. Pension plan. Applications may be obtained from Milwaukee County Civil Service Commission, Room 206, Courthouse, Milwaukee 3, Wisconsin, and must be on file before 4:00 P.M., September 16, 1955.

POSITIONS VACANT

Civil Engineers—Two desired immediately by the City of Birmingham. Starting salary $4966 per yr., 40-hr. week and liberal vacation, sick leave, holiday, group insurance, and retirement benefits. Must be college graduate in civil engineering; experience desirable but not necessary. Submit complete written application to Asst. City Mgr. Birmingham, Michigan.

Experienced Office Engineer is needed by the City of Fresno, California for a permanent civil service position. Must have civil engineering degree and supervisory experience. $509.00-$544.00 per month. For further information contact Civil Service Board, Room 203, City Hall, Fresno, California. Last day for filing applications is September 2, 1955.

Estimator for building construction firm with main office in Boston. Must have engineering background and experience in this type of work. Permanent position for qualified applicant. Salary open. Write Beacon Construction Company, 102 Hano Street, Allston 34, Massachusetts.

Structural Engineer: Graduation from a college or university of recognized standing with a degree in engineering, specializing in structural engineering, and 5 years experience in a responsible capacity involving design of all sizes and classes of buildings and structures or an equivalent combination of experience and training. Salary $5512-$6344 per year. Complete details by writing to Director of Personnel, Municipal Building, Hartford, Conn.

Bridge Designer: Wanted by Seaboard Air Line Railroad; civil engineering graduate; experience desirable; salary range $450 to $550 depending on experience. Write W. D. Simpson, Chief Engineer, Seaboard Air Line Railroad Company, S.A.L. RR Bldg., Norfolk 10, Virginia.

Administrative Assistant to Chief construction engineer for a large consulting engineering firm located in New York City. Must have had experience as resident engineer on highway survey, construction, bridges, etc. Applicants requested to furnish resume of education and experience. All applications will be held confidential. Salary open. P-7399, Engineering News-Record.

Bridge designer with at least four years experience in designing highway bridges for work in general office of state highway department in Rocky Mountain area. Give summary of experience and training and minimum salary acceptable. Address reply to P-7379, Engineering News-Record.

EMPLOYMENT AGENCIES

Wanted Engineers, Designers, Draftsmen- Structural, Architectural, M.E., C.E., E.E., and Ind., also Teachers and Chemists, Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

Civil Engineer, 15 years field experience. Industrial and commercial buildings desires position in office of general contractor, estimating, purchasing, etc. midwest location. PW-7199, Engineering News-Record.

Civil, sanitary engineer, grad., reg. Wants responsible position in Midwest. Consider partnership. 15 years experience all phases water and sewerage design. Also drainage, structural design, reports. PW-7420, Engineering News-Record.

Construction Engineer, graduated with over 20 years experience as resident manager, cost and office engineer on domestic and overseas jobs. Very reliable. Knowledge of foreign languages. Capable of administration, planning and cost control. Just completed overseas assignment in Pacific. Write to PW-7418, Engineering News-Record, 68 Post Street, San Francisco 4, California.

Civil Engineering draftsman and surveyor. N.Y.S. Lic. Over 30 years municipal experience, highways, water-works, sewers, etc. A-1 references. PW-7355, Engineering News-Record.

Field Engineer, young ambitious, 6 yrs. exp. heavy constr: hwys, bridges, indust. bldgs, desires position ass't superintendent, structures preferred, New Jersey area. PW-7365, Engineering News-Record.

Registered Professional engineer and construction superintendent, twenty years experience, desires position. Available September first. PW-7366, Engineering News-Record.

Thirty years experience as construction, industrial or safety engineer desires position, domestic or foreign work. PW-7390, Engineering News-Record.

Building Construction Executive, thoroughly experienced estimating, trying sub-contracts, materials, etc.; managing field to produce good costs. PW-7424, Engineering News-Record.

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These positions offer opportunities for long term employment with attractive salaries, paid vacation and holidays, sick leave allowance, moving allowance, and group insurance and hospitalization program.

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Recent design experience on petroleum refineries, chemical plants, or related projects. Compensation commensurate with ability. Liberal moving allowances.

Please write furnishing complete chronological experience record and salary history, also full details regarding education, salary desired, businesss and character references.

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P-7054, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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Work is in air-conditioned St. Louis office on long-term projects, with ample opportunity for professional development and advancement.

Assistance with moving expenses, excellent employee benefit and retirement plan, Blue Cross, paid vacations and holidays and sick leave.

Please send complete experience record, references, date available and salary desired in first letter.

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Interested in design and development of products and equipment for building and highway construction field—minimum of three years experience in construction or allied manufacturing field preferred. Work consists of design of products and related equipment and some laboratory and field work in conjunction with this design. Salary open—excellent working conditions.

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Non-Deductible Insurance
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Opportunity to acquire comprehensive experience in sewer construction and sewage treatment fields. Position under Civil Service. Applicant must be resident of New York State.

P-7417, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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Federal 10-ton Army 6x6, all wheel drive 10-wheeler, equipped with 10-ton Power Driven 27 foot telescopic boom, two heavy duty winches. Equipped with outriggers. 11:00 x 20 tires, air brakes, very good condition. Ideal to handle steel or other heavy material. Swing crane that will swing 180 degrees right or left with full power. Fifth wheel to handle semi-trailers—will pull capacity up to 50 tons. Only 20 in stock. They will go fast at this low price.

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FS-7380, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

BUSINESS OPPORTUNITY

Card File of subcontractors for sale general contracting firm, about to retire from business, has card file of subcontractors and materialmen, covering both building and heavy construction work. This file has been built up over a period of years and contains approximately 10,000 cards in eight steel drawers, covering mostly southern New England and the Middle Atlantic states plus Maryland, Delaware, the District of Columbia and Virginia. Cards recently verified for address. Index of classifications will be furnished upon request. BO-7351, Engineering News-Record.

SPECIAL SERVICE

Gulf Coast Group of engineers and draftsmen available to do design and drafting on contract basis. Licensed and experienced in civil, structural, plant layout, mechanical (piping, vessels), and electrical. Attractive proposition for over-loaded engineering firm or fabricator. SS-7201, Engineering News-Record.

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BUCYRUS-ERIE DRAGLINE model 9W 8 yd. bucket, with 200' boom

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MERTES MACHINERY COMPANY
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36 TANK CARS TANKS
10,000 & 8000 GAL. CAP.—WITH OR WITHOUT HEATING COILS
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5. 1952 Metal Office Trailer, 31 Ft., completely equipped with stove, lavatory, desks, chairs, shelves, ventilators, etc.
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All of the above are in good condition. Reasonable.

Write or phone Raylin—Lynn, 11 West 42nd St., New York 36, N. Y. (Tel.: BRyant 9-2518).

FOR SALE
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10,000 Feet, Blaw-Knox, 10" Heavy Duty Road Forms, 10' sections, excellent condition. Write:

W. L. JOHNSON CONSTRUCTION CO. AND ASSOCIATES
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EDITORIALS

What Does "Cost-Plus" Cover?

A CONTRACTOR MAY NOT INCLUDE CHARGES for the use of his tools and equipment as part of the cost of a building that he is constructing under a contract setting his compensation at a percentage of "the entire cost of the building." Nor can he include a proportion of the salaries of his officers who supervised the work, nor part of his office overhead. That ruling was made last spring by a court in New Jersey, and reported in ENR April 14, p. 76.

Upon reading that news item, a top executive of one of the country's large construction firms wrote ENR asking for corroboration. "If tools are to be furnished out of the contractor's fee," he said, "where is the line to be drawn?"

To our surprise, we learn that this decision is in line with earlier decisions on the same subject in New Jersey as well as in some other states. In his book, "Legal Guide for Contractors, Architects and Engineers," I. Vernon Werbin cites several instances. In one of the earlier cases, a New Jersey court said that in the absence of a contrary agreement, when a contractor agrees to build he agrees to furnish all the tools and appliances needed to perform the work. It also ruled out inclusion of part of his overhead as a cost.

More recently, the Supreme Court of Wisconsin ruled that "use of equipment and tools, and general office expenses" are items of overhead that "cannot be charged as actual cost" (ENR Dec. 23, 1954, p. 38). The Wisconsin court went on to say that to permit inclusion of such overhead items as interest charges on performance bonds, depreciation, taxes and the general office expenses "would open the doors to a flood of obligations not intended by the innocent words in a contract such as the one before us."

If a decision such as the latest one in New Jersey had been made in only one local court it would not be unreasonable to expect that other courts might make rulings more in harmony with what engineers and contractors consider to be legitimate elements of the cost of a building. But it is more logical to assume that the reasoning of the New Jersey and Wisconsin courts will be widely accepted by other courts.

The significance of this for contractors appears to lie in that qualifying phrase, "In the absence of a contrary agreement," used by the judge who wrote one of the New Jersey decisions. A contractor who becomes a party to a cost-plus contract can keep unfavorable decisions of this kind from affecting his pocketbook by seeing that the contract states specifically that reasonable compensation for the use of his tools and equipment is to be considered part of the cost on which his fee is figured. Similarly, the contract also should state what part, if any, of his overhead costs can be charged against the project. In the absence of evidence in the contract that the parties have specifically agreed on these matters, the courts can be expected to follow the precedent set in those states where the rule against including such items prevails.

Road Financing Study Needed

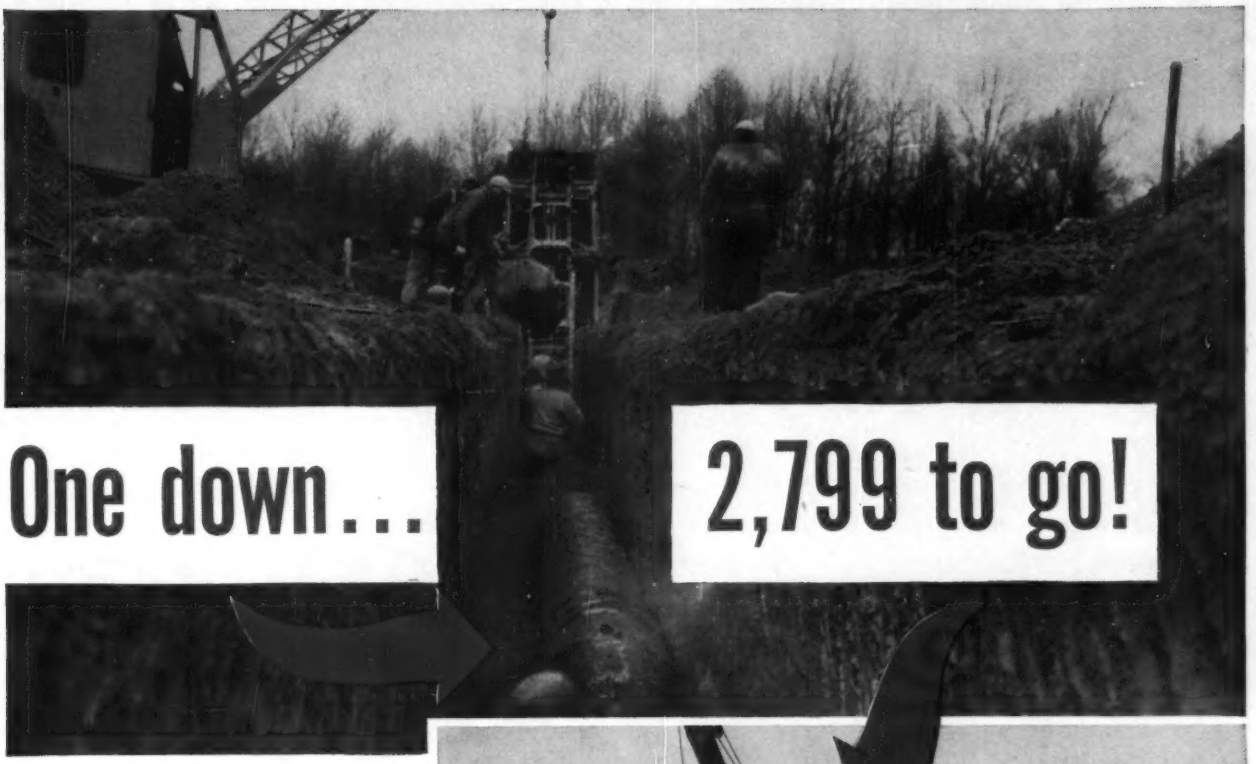
THE CONFERENCE OF STATE GOVERNORS, meeting last week in Chicago, quite properly placed first on its program a discussion of Congress' failure to pass a highway bill. The discussion, however, was pretty fruitless because the governors could come no closer to agreement on how to finance the necessary roads than Congress did. In fact, so many divergent plans were suggested that a later proposal for a special session of Congress devoted to enacting a highway bill lost any logic that it might otherwise have had.

What is needed is not more off-the-cuff financing ideas, which a special session of Congress now would be sure to produce, but a carefully detailed and documented financing study that Congress could use with confidence in drafting a sound highway bill.

There are a good many financing paths available, and each of them deserves more objective study than it has yet received. Basically, however, all financing methods are a variant of two ways of raising money—by bonds or by pay-as-you-go taxes, and it is on these that a study should focus. For example, the use of bonds requires the payment of interest, which has been criticized as an added, unnecessary cost. The study could investigate this point by an analysis of the amount of increased revenue a quickly built road system financed by bonds would create over a system that would not be equally available for use for a much longer time. It could also investigate the long-term trend of construction costs to determine how much cheaper, if any, roads built now would be over roads built over a period extending far into the future.

Pay-as-you-go possibilities are deserving of equally careful exploration. There was the feeling that the defeated Fallon Bill put an unfair tax burden on heavy trucks, yet figures to support this charge are lacking. Equally lacking are facts on how much of the needed highway program could be carried by road-user taxes that are now diverted to other purposes.

In the six months before Congress meets again there is ample time for such a study to be completed, thus giving Congress some really sound facts to work on in drafting a sound highway bill—and to bolster its courage in enacting the bill into law. The one agency that could best make this study is the Bureau of Public Roads. And it could probably find the necessary funds in its research budget or get them from the Executive or Commerce Departments. In one way or another, it seems essential that a road financing study be undertaken this year.



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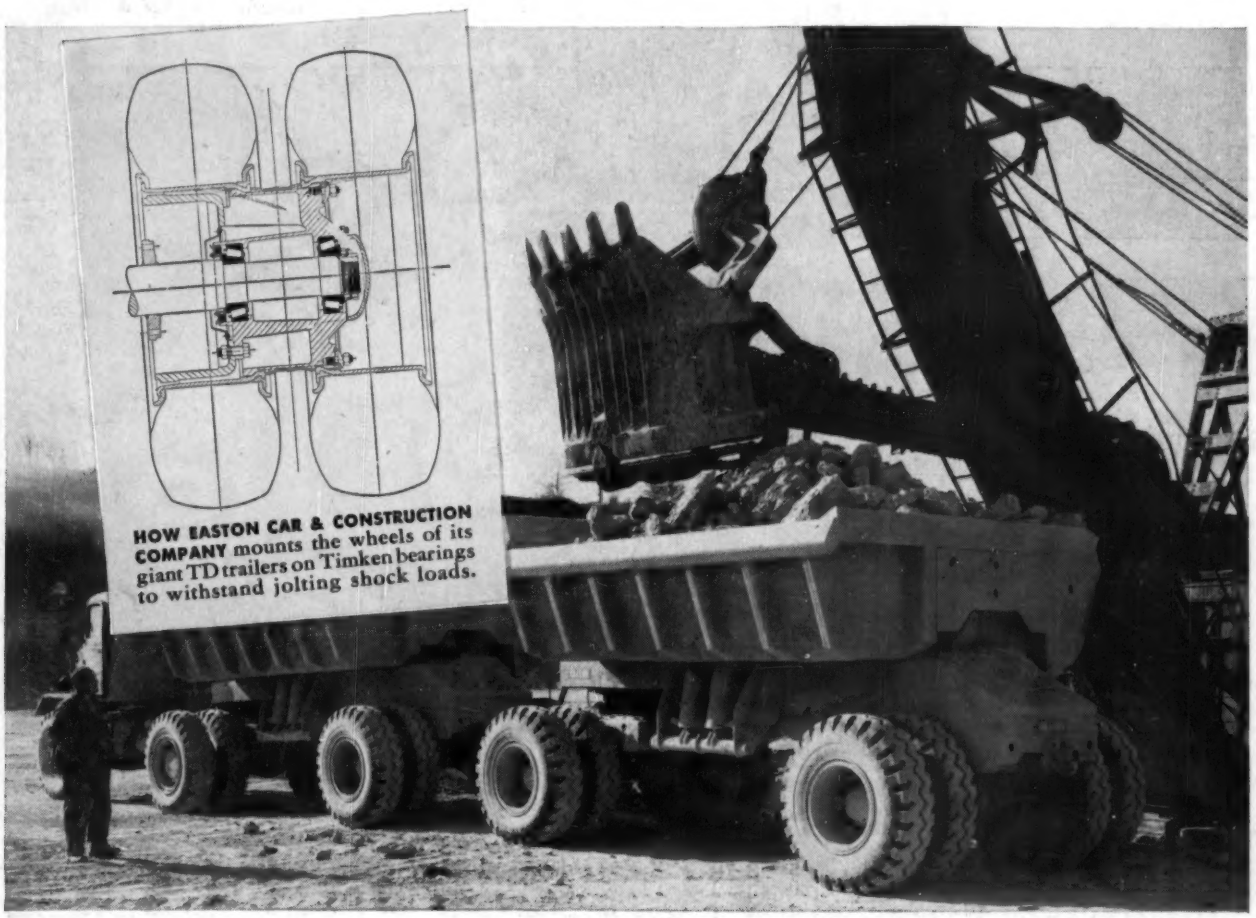

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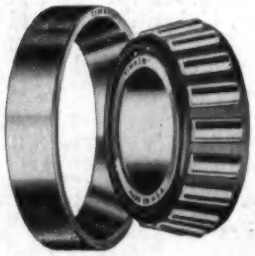

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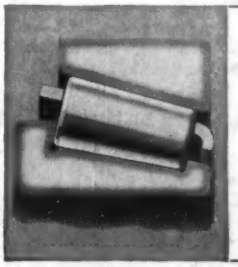

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